The Global Trigger List

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Shifter Tutorial
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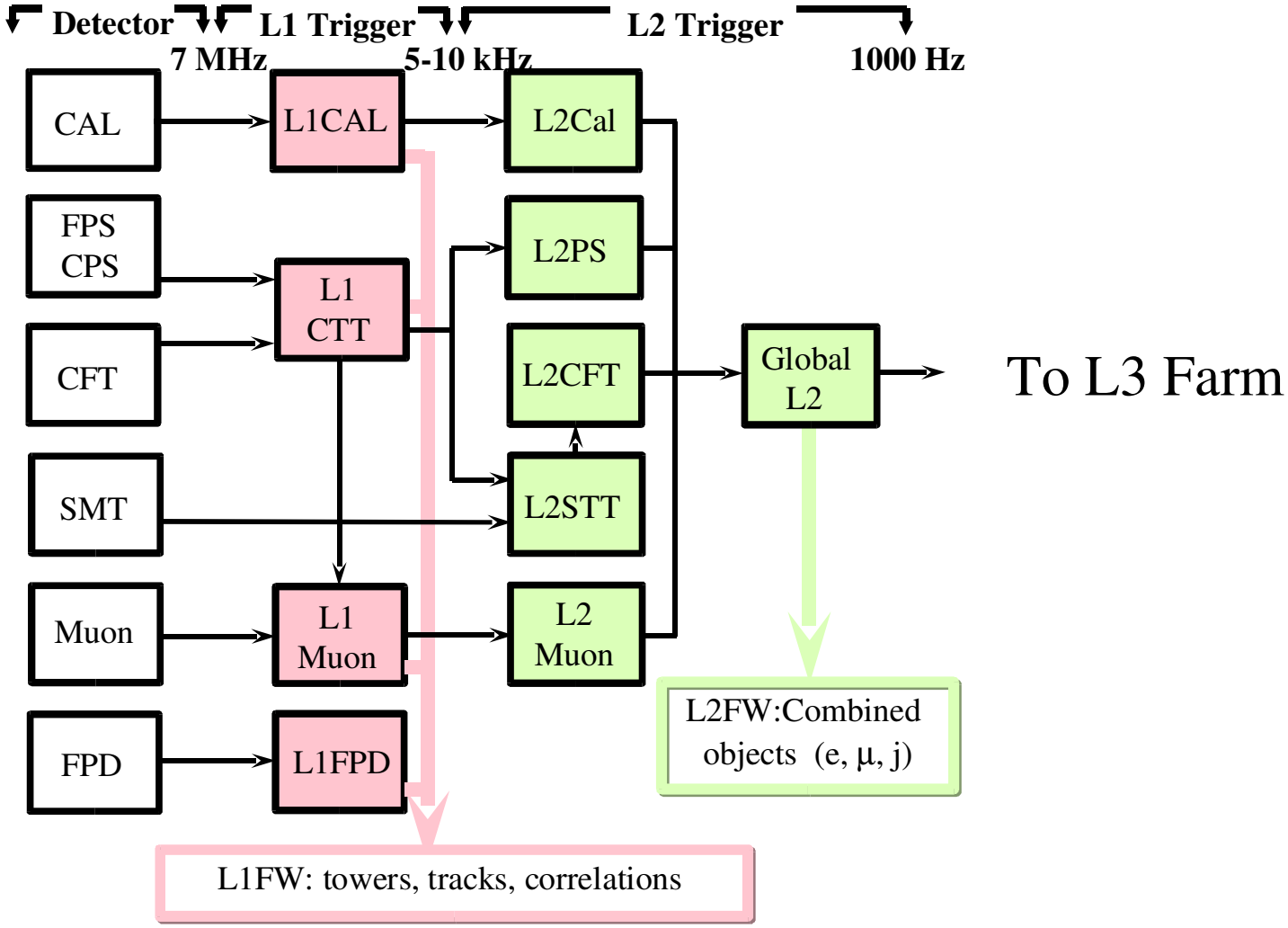
Brief Outline

- Construction of a trigger list
  - Many of these slides are thanks to Elizabeth Gallas
- Trigger Monitor tools

Trigger Fundamentals

- Effect of the 'Trigger' system
  - given over a million opportunities for collisions ('events' per second)
  - choose <50 to record for later analysis
- Selecting events:
  - Some fraction of these events are not 'rare' (but still useful):
    - Low energy jet production via QCD …
    - Measure luminosity …
    - Detector monitoring …
  - The study of rare processes and the discovery of unknown phenomena require maximal 'exposure' to the beam
    - Need well designed triggers that can remain unprescaled at the highest luminosity
- The trigger system is designed to
  - Record the wide variety of processes that D0 physicists are interested in.
  - It does this using a 'trigger menu' (or Trigger List) which is complex by necessity

The D0 Trigger system – L1/L2



To L3 Farm

Trigger System Design

- Fast, complex, high rate,…,multi-level
  - Level 1 - electronics and firmware
    - reduce 1 MHz to 10 kHz (presently 1600 Hz) by looking for interesting signatures (high Pt tracks, high Et energy deposition)
  - Level 2 - firmware and software
    - 10 kHz to 1kHz (presently 800 Hz) by refining L1 objects, match objects found by different detectors
  - Level 3 - software
    - 1kHz to 50 Hz - execute streamlined versions of offline reconstruction programs to select events.
- Programmable !
  - through the 'trigger configuration' generated from Trigger Lists stored in the Trigger Database
  - and online resource allocation by COOR

Trigger Database Purpose

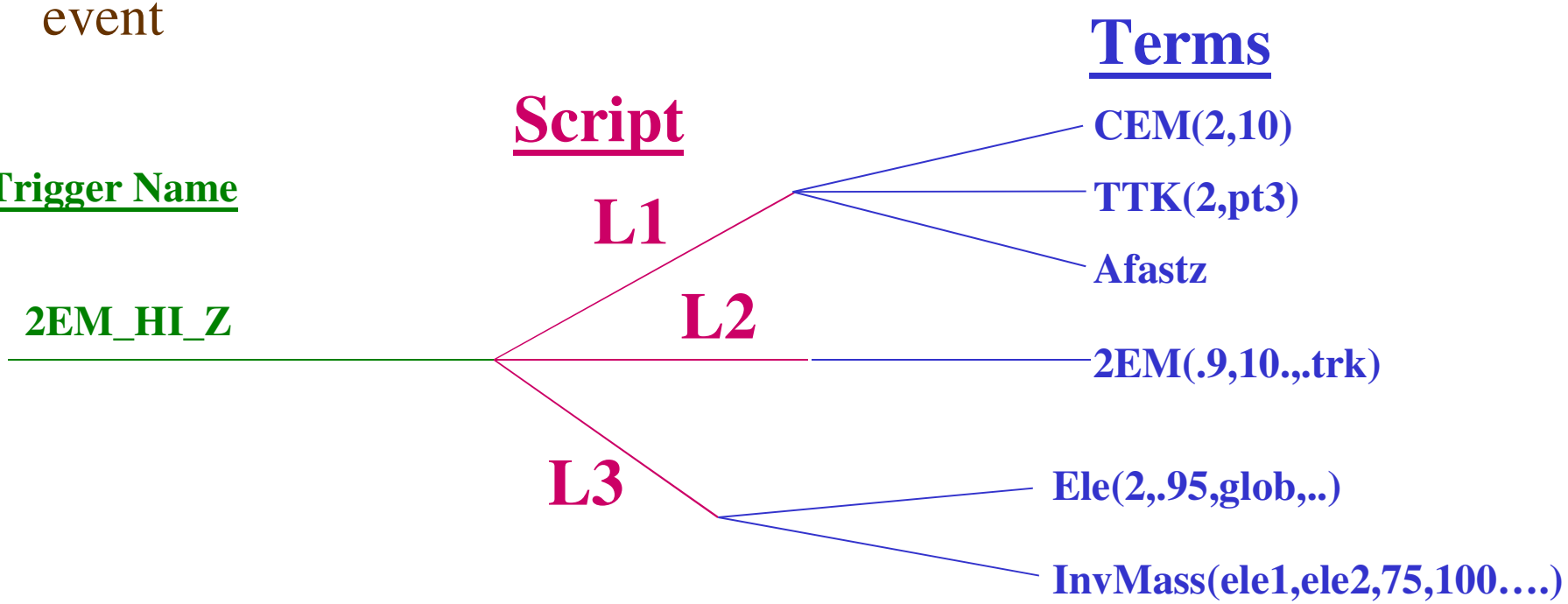
- **Generate**:
  - precise programming for trigger configuration
    - ONLINE
    - SIMULATION
  - The configuration format: 'xml'
    - Extensible Markup Language (XML) universal format for structured docs and data on the web
    - The trigger 'xml' does not contain all the information stored in the trigger database, specifically wrt versioning, how one trigger list relates to another triggerlist, or descriptions.
- **Store**
  - all global Trigger Lists used online in Run 2
  - Bench march Trigger Lists for simulation
- **Report**
  - trigger configuration settings
    - for use by offline analysis programs
      - Et thresholds, eta ranges ...
    - to the collaboration (web), with some documentation features
      - not intended as a substitute for trigger subsystem documentation !

Trigger Database Implementation

- **Design**:
  - Three levels of decision making
    - Level 1 - hardware, firmware
    - Level 2 - firmware, software
    - Level 3 - software
  - complexity is a reflection of the complexity of the trigger
  - symmetry/commonality is taken advantage of wherever possible
  - seemingly cryptic nomenclature reflective of trigger programming.
- **Implementation**:
  - IN USE for all global trigger configurations since December 2001
- **Documentation**:
  - Specifications from
    - COOR document (Scott Snyder)
    - D0 Trigger/Online Groups
  - Trigger Database
    - see Entry Interface 'help' button

A Trigger is a Logical Condition

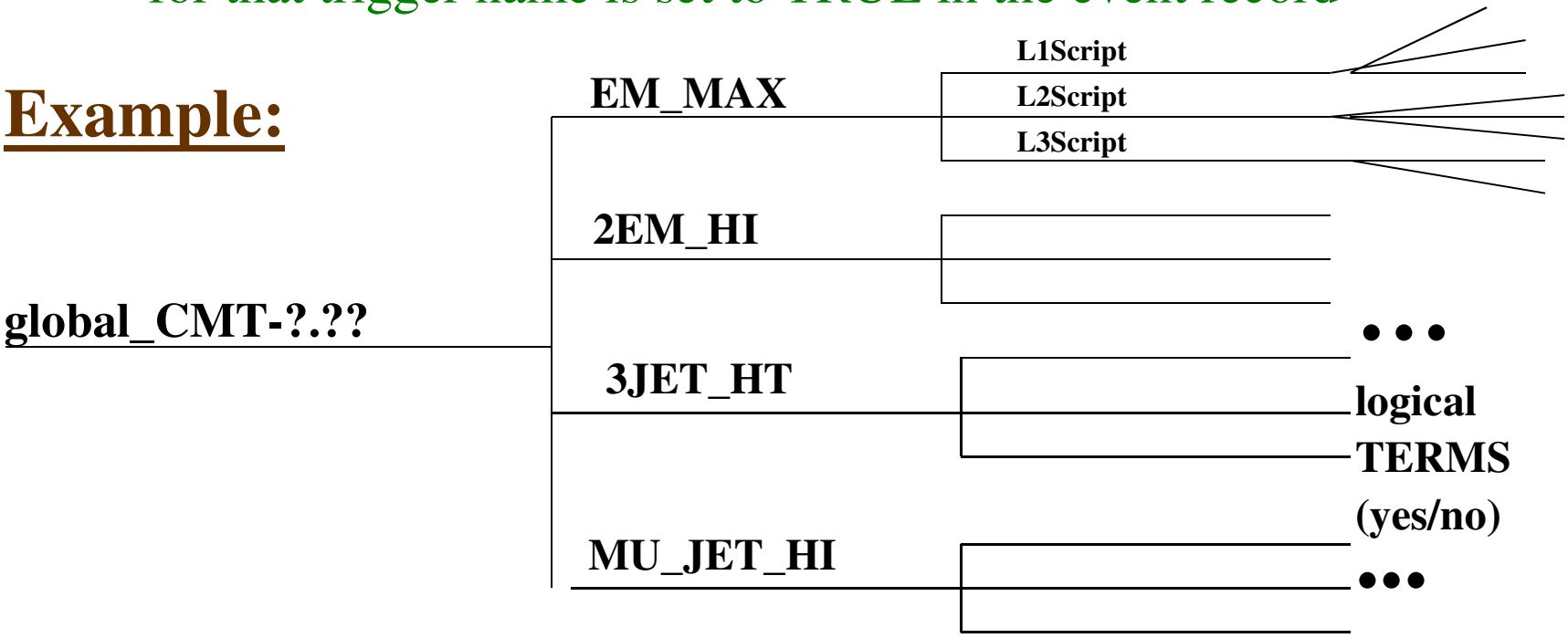
- identified by a **trigger name**
- with a set of criteria called a Script at Level 1, Level 2, and Level 3
  - > Each of which is satisfied if all of its logical conditions or **TERMS** is satisfied
- satisfied (true) for an event if all 3 Level Scripts are true for that event



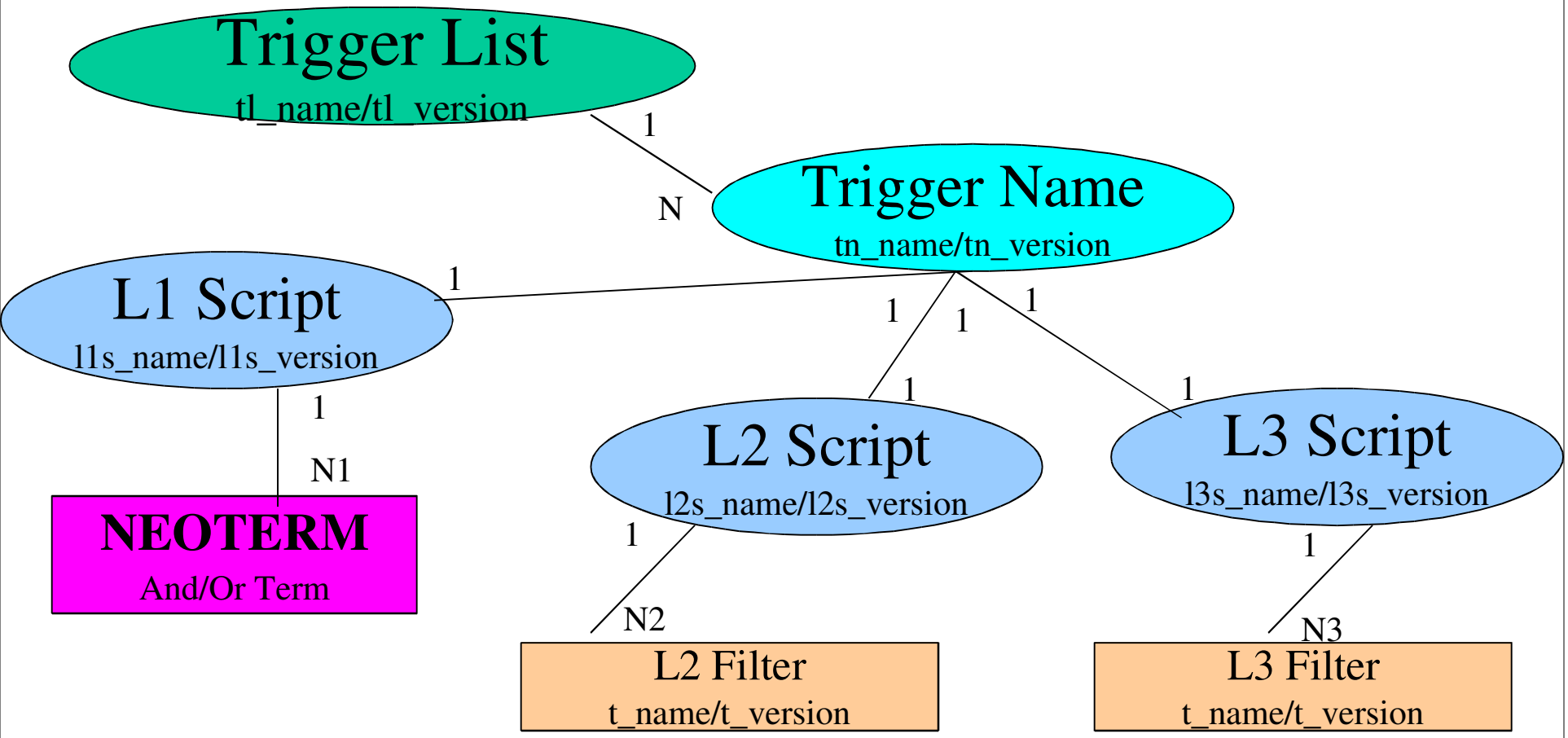
A Trigger List

- identified by Triggerlist Name/Version
- contains one or more triggers
- like a tree with Triggers as branches
  - if any trigger is satisfied, the event is recorded and the trigger bit for that trigger name is set to TRUE in the event record

Example:



Trigger Database Design



NAME/VERSION scheme is repeated throughout the design.
The name is intended to reflect the conditions in that definition

Trigger Nomenclature – L1

- NEOTYPE – an L1 detector class
  - Group NEOTERMS which shares common download mechanisms
    - Examples: ctt, fpd, fps, muo, emcount, jetcount … specterm
- NEOTERM – the "And/Or terms"
  - For any event: result is TRUE or FALSE
  - Map into the L1 And/Or Framework
  - Combine one/more to form a Level 1 Script decision
    - Examples: TTK(1,1.5), Afastz …
- L1 Script decision
  - Logical AND of one/more NEOTERMS

Level 1 Trigger Systems

C -- Calorimeter -- based on Calorimeter "trigger towers"

- emcount / CEM(n,Et[,Hv]) – Cal EM TTower
- jetcount / CJT(n,Et) – Cal Jet (tot) TTower
- misspt / CME(MEt) – near future

M -- MUON – based on Muon system scintillator, PDT,MDT and CFT

- muo / MUO(n,Pt,eta,scint,wire,option)

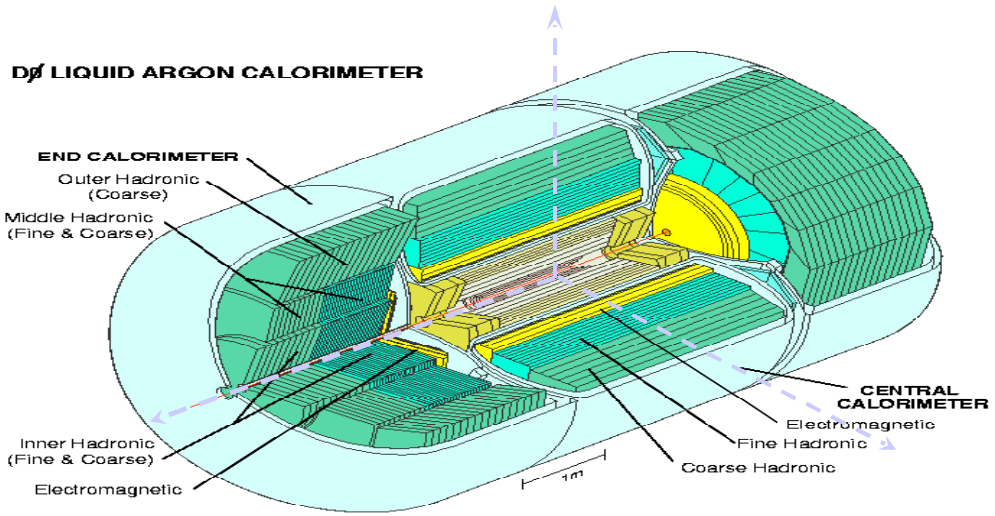
T -- CFT/CPS

- ctt / TTK(n,p) – CFT track
- ctt / TIS(n,p) -- Isolated track
- ctt / TIQ(n,p,q) -- Isolated tracks in a quadrant
- ctt / TIL - Isolated track(s) with low home-sector occupancy.

A -- Special (L1 Framework terms)

– constructed from signals from: the Accelerator, Luminosity Monitor, Trigger Timing and Control
  - Afastz, ALiveBX, ASkip0 …

DØ: Calorimetry

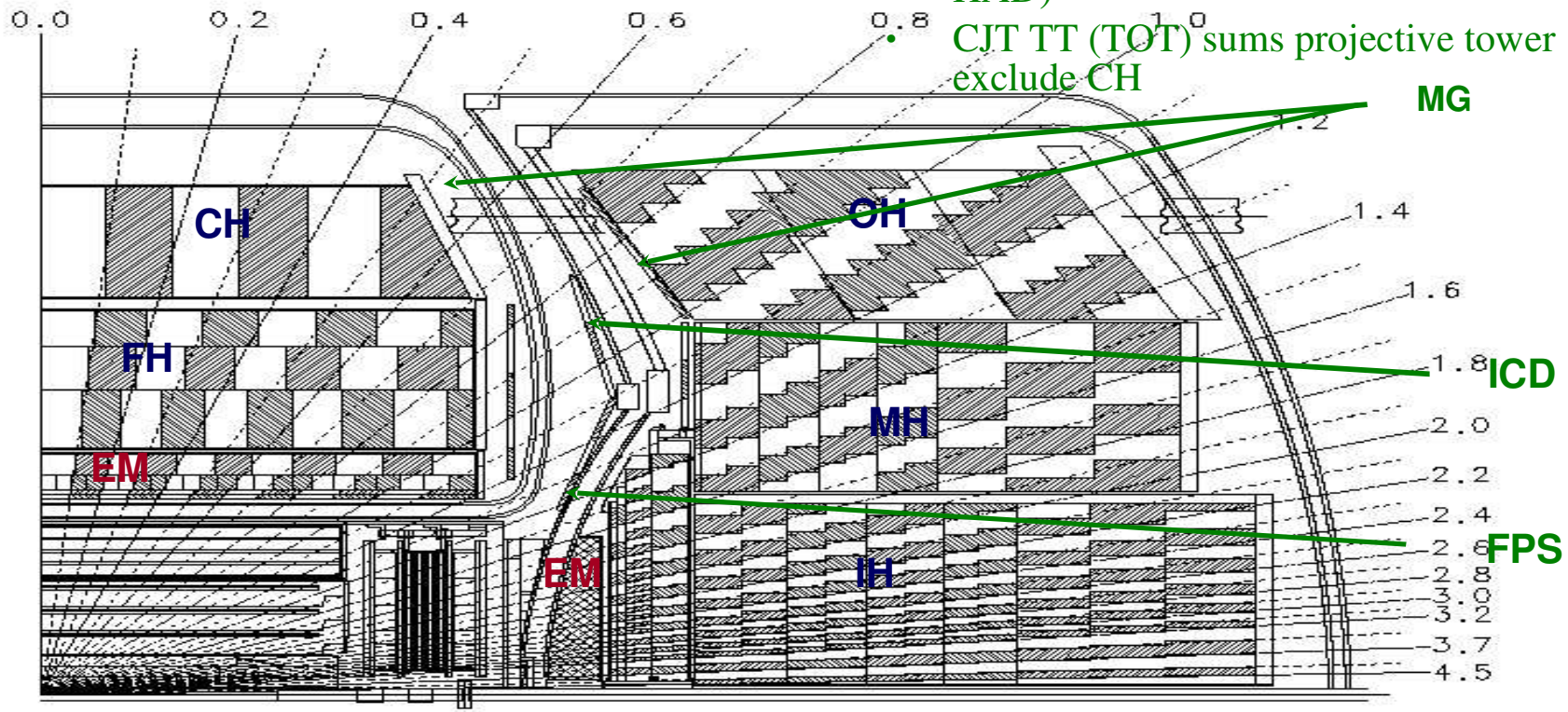


Features

- Projective geometry
- Cell size: 0.1 x 0.1 in eta x phi

L1 Cal Trigger exploits features

- Fast summing of Cal cell energies in towers (called Trigger Towers or TT)
- 0.2 x 0.2 in eta x phi
- CEM TT sums EM section (optional veto on HAD)
- CJT TT (TOT) sums projective tower exclude CH



L1 Muon Trigger

Trigger Object Report - Netscape

Name= **MUO** , Version= **2.00** , Use_Status= **used** , Current_Status= **current** . Created (Modified) by Gallas on 06-Jan-2002_18:00 (06-Jan-2002_18:00)

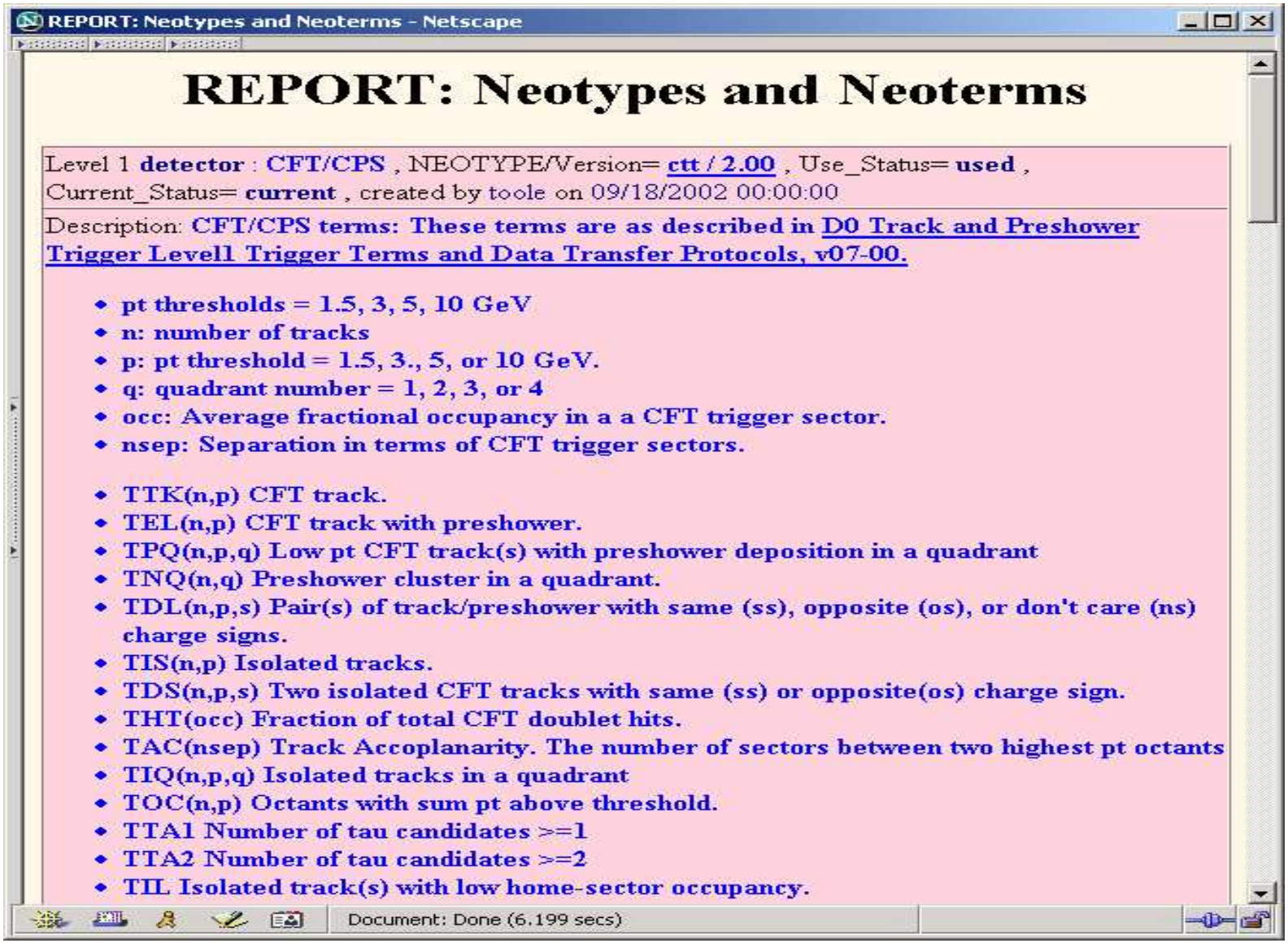
Description: **Muon global track combining CFT and/or Central Muon (PDT's and Scintillator) and/or Forward Muon (MDT's and Pixels).**

See Level 1 Muon Terms Description

order	name	type	Description
1	Mult	int	Muon track multiplicity. Possible values: • **0** == no tracks, • **1** == one track, • **2** == two tracks, • **3** == three tracks (generally not implemented but could be).
2	Pt	string	Pt (transverse momentum) threshold. Possible values: • **ptx** == no momentum selection (L1CFT not used), • **pt1** == pt1 of the L1CFT, • **pt2** == pt2 of the L1CFT, • **pt3** == pt3 of the L1CFT, • **pt4** == pt4 of the L1CFT.
3	Eta	string	eta (pseudorapidity) range. Possible values: • **C** == Central: |eta|<1.0 (central muon system only), • **W** == Wide: |eta|<1.5 (CFT system coverage), • **A** == All muon: |eta|<2.0 (muon system coverage), • **N** == North: eta between -1.0 and -1.5, • **O** == north: eta between -1.5 and -2.0, • **P** == north: eta between -2.0 and -1.0, • **S** == South: eta between +1.0 and +1.5, • **T** == south: eta between +1.5 and +2.0, • **U** == south: eta between +1.0 and +2.0, • **B** == Between: -2.0>eta>2.0 but not -1.0>eta>1.0. (forward muon system only)
4	Scint	string	L1CFT.and.scintillator quality (MTC05). Possible Values: • **L** == Loose, • **T** == Tight, • **X** == no requirement • **E** == Experimental.
5	Wire	string	Wire.and.scintillator quality (MTC10). Possible Values: • **L** == Loose, • **T** == Tight, • **X** == no requirement • **E** == Experimental.

Document: Done (2.764 secs)

L1 CTT Trigger



Audience Participation @ L1!

- Decode L1 neoterm name: CEM(1,5)
  - **Starts with a "C" -- Calorimeter**
  - **CEM (Sum Electromagnetic Trigger Towers)**
    - **CEM(n,Et[,Hv])**
  - **N = 1 – Requires ONE EM TT with**
  - **Et > 5 GeV and**
  - **No Hv – NO Hadronic veto**
- Decode L1 neoterm name: mu2pt3wtlx
  - **Starts with a "m" – Muon / (maybe CTT)**
    - **MUO(n,Pt,eta,scint,wire,option)**
  - **N = 2 – DIMUON**
  - **Pt3 – requires pt > 3rd CTT threshold**
  - **Region = 'w' – WIDE region (CFT coverage)**
  - **Scint = 't' – TIGHT req. on muon scintillator**
  - **Wire = 'l' – LOOSE req. on muon PDT/MDT's**
  - **Option = 'x' – no additional options**
- Decode L1 Script Name (seen in DAQmonitor): TTK(2,3.)TTK(1,5.)_CEM(2,3)CEM(1,6)_ncu

L1: Whaaaaat's that ?

- '_ncu' – started appearing in L1 Script names for global_CMT-11.00
  - Cal_unsuppressed / 1
    - New trigger in it's own exposure group
    - Read out all Calorimeter cells unsuppressed
  - All other triggers were changed to veto on that L1 condition
- Other 'short names' used in L1 Scripts:
  - '_fz' – requires Afastz
  - '_nfz' – veto on Afastz

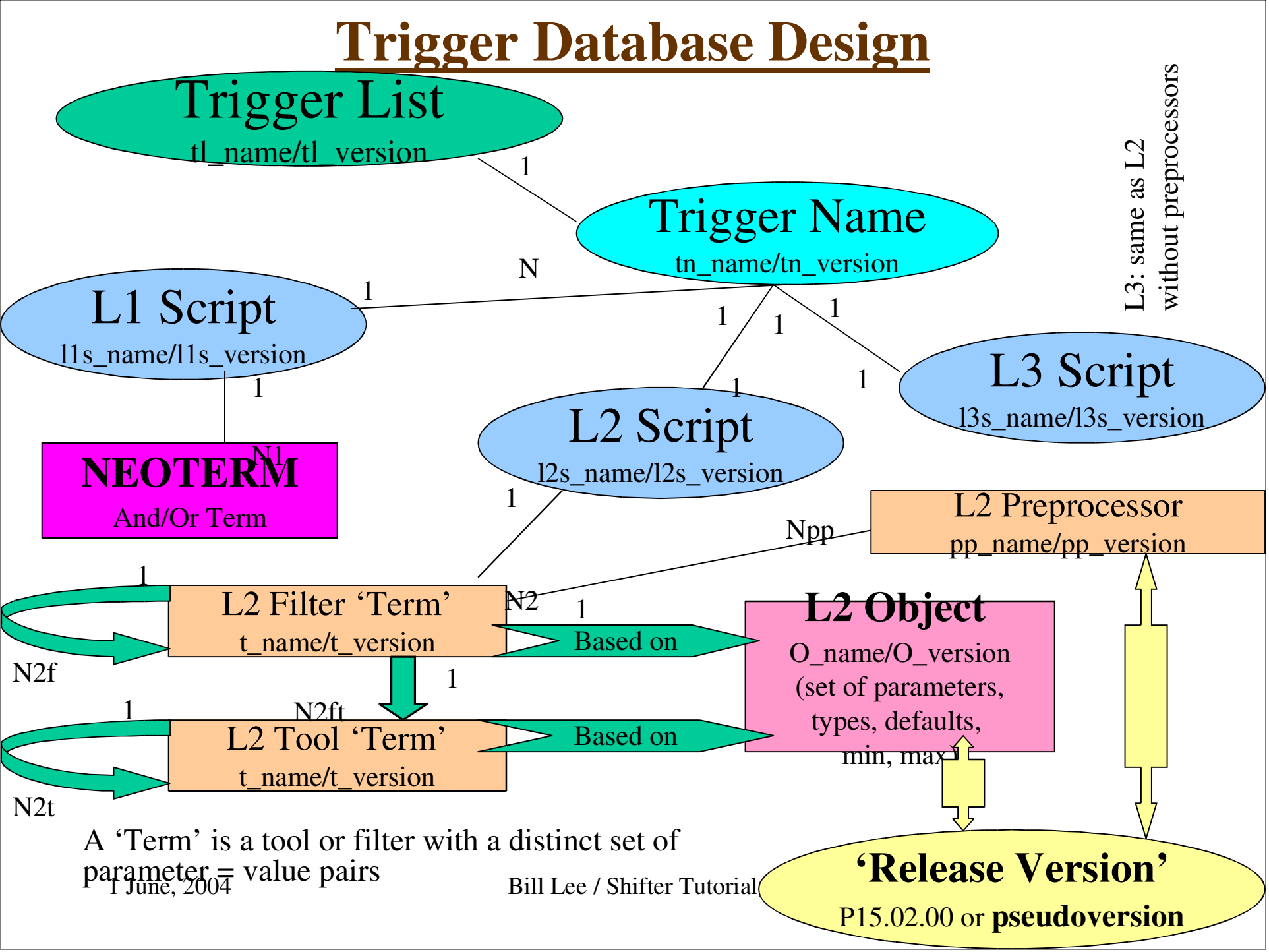
Trigger Nomenclature – L2, L3

- OBJECT
  - Has a distinct name
    - At Level 2: EM, JET … or at Level 3: L3TEle
  - Has a distinct set of parameter definitions
    - Name, type, default, min, max, description
  - Has a distinct type
    - TOOL or FILTER
    - Basis for all TOOL and FILTER TERMs (below)
  - Associated with one/more L2/L3 ‘releases’
- TOOL TERM
  - An instance of a TOOL type OBJECT giving values to each parameter
    - Aside: At L2, TOOLS depend on getting input from the L2 preprocessors in the Run
  - Can depend on other tools
    - Example: Jet finding TOOL uses clusters from a Cal Cell Clustering TOOL which uses Cell Energies unpacked by a Cal Unpacking TOOL
  - **Finds candidates** for other tools, filters

Trigger Nomenclature – L2, L3 (cont)

- FILTER TERM
  - An instance of a FILTER type OBJECT giving values to each parameter
  - Can depend on other filters
  - May find candidates for higher level filters
  - **Makes cuts on candidates**
  - For any event: result is TRUE or FALSE
- L2,L3 Script decision
  - **Logical AND of one/more FILTER TERMS**

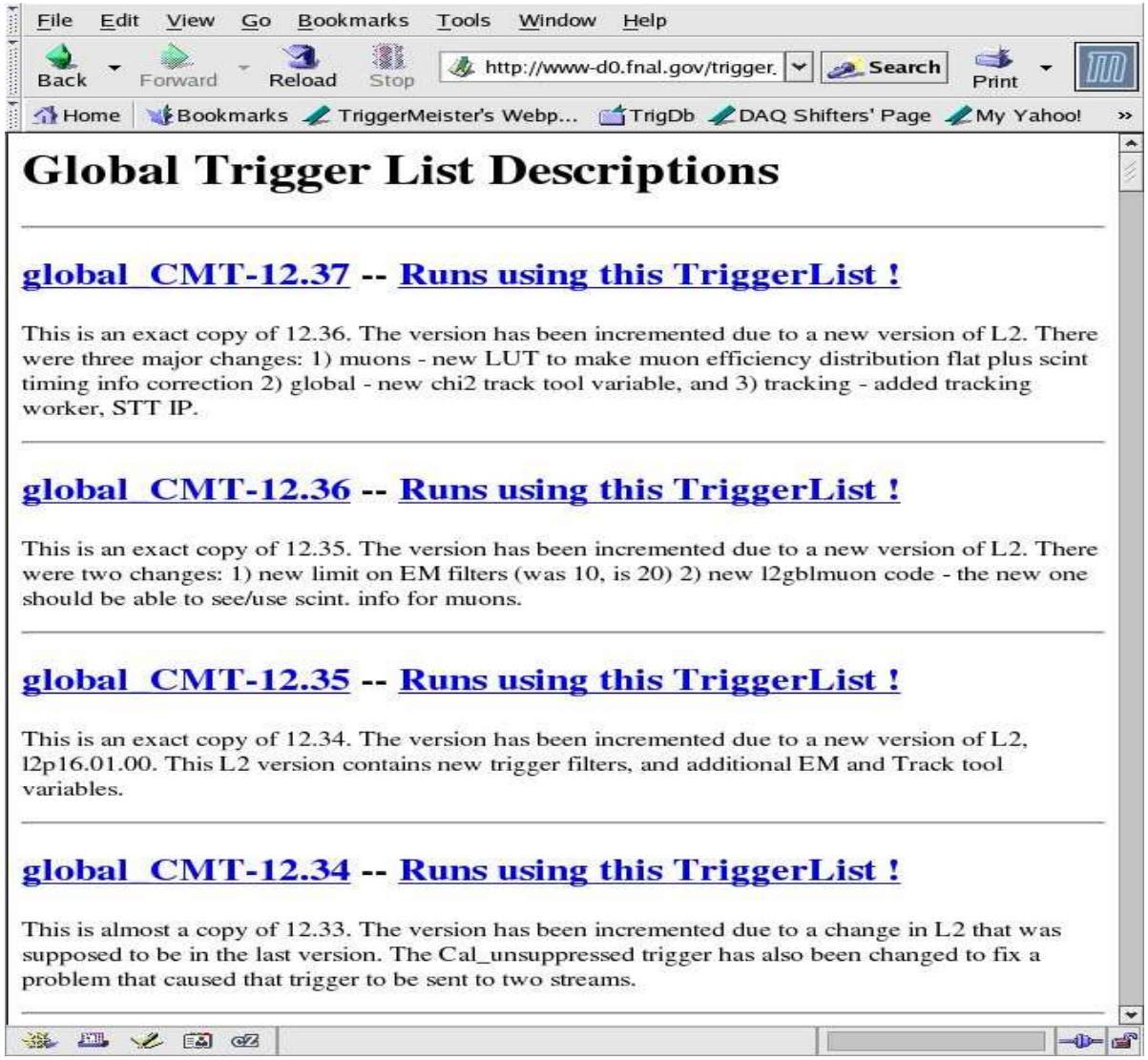
Trigger Database Design



A 'Term' is a tool or filter with a distinct set of parameter = value pairs

Trigger List History

Link off of Triggermeister page



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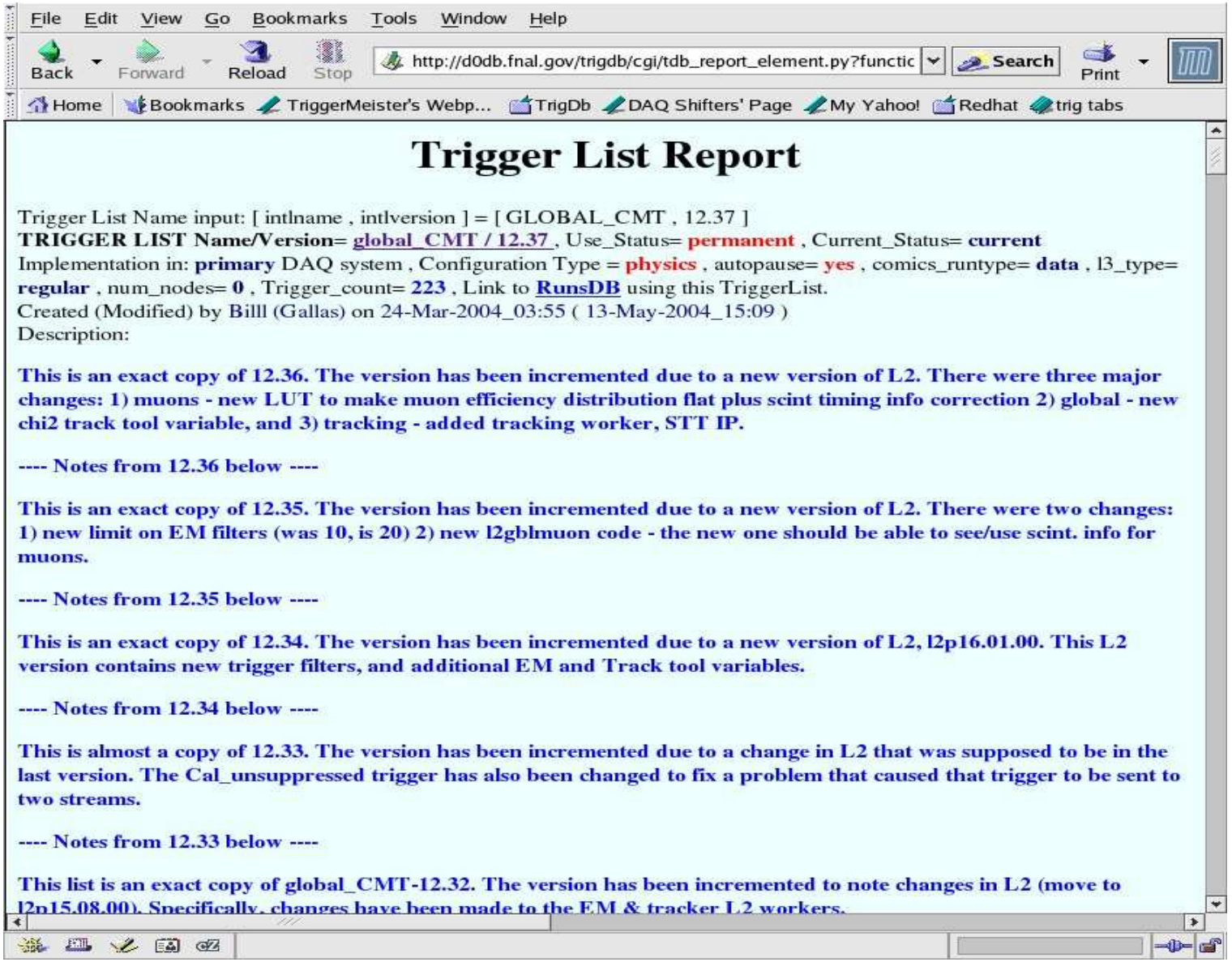

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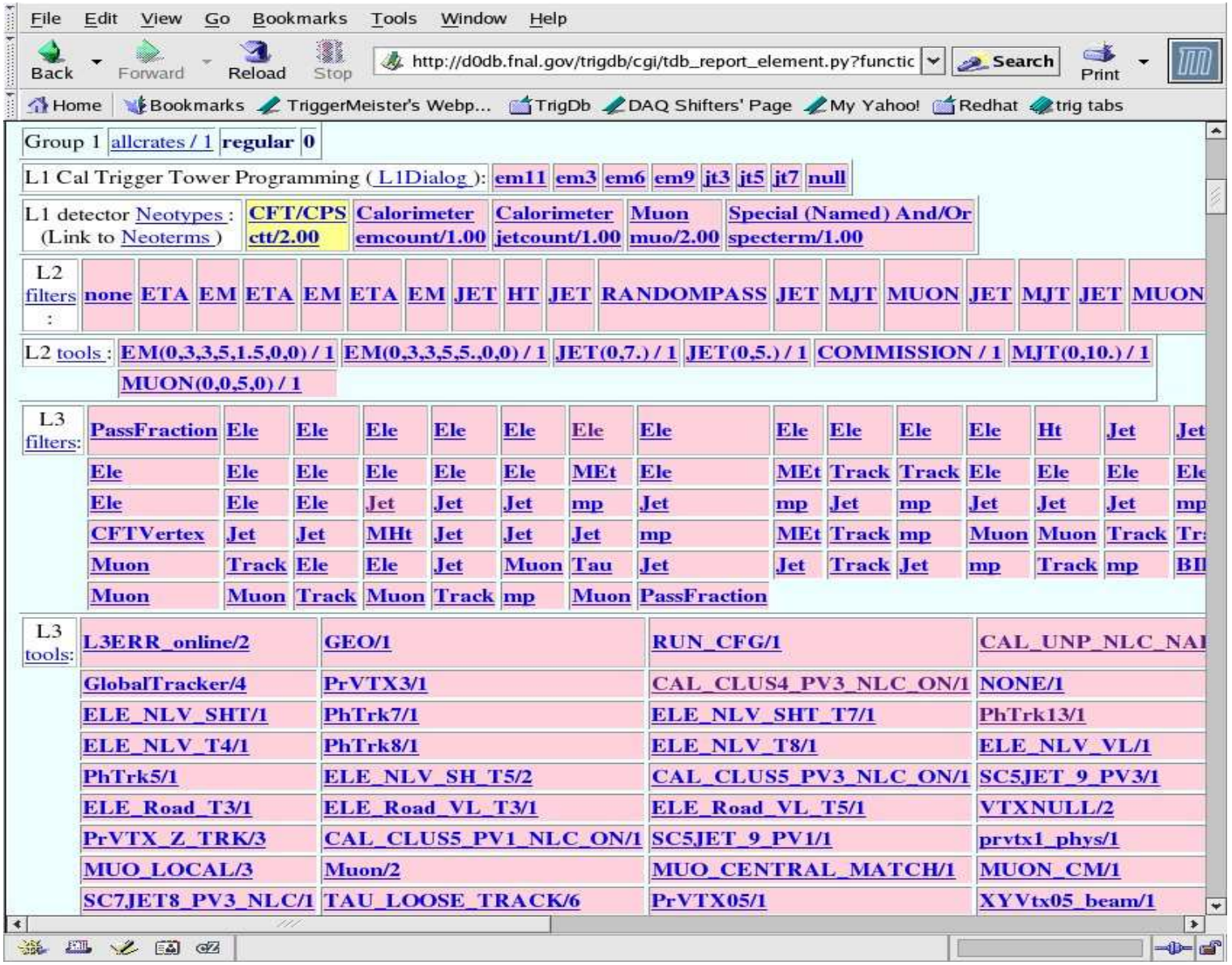

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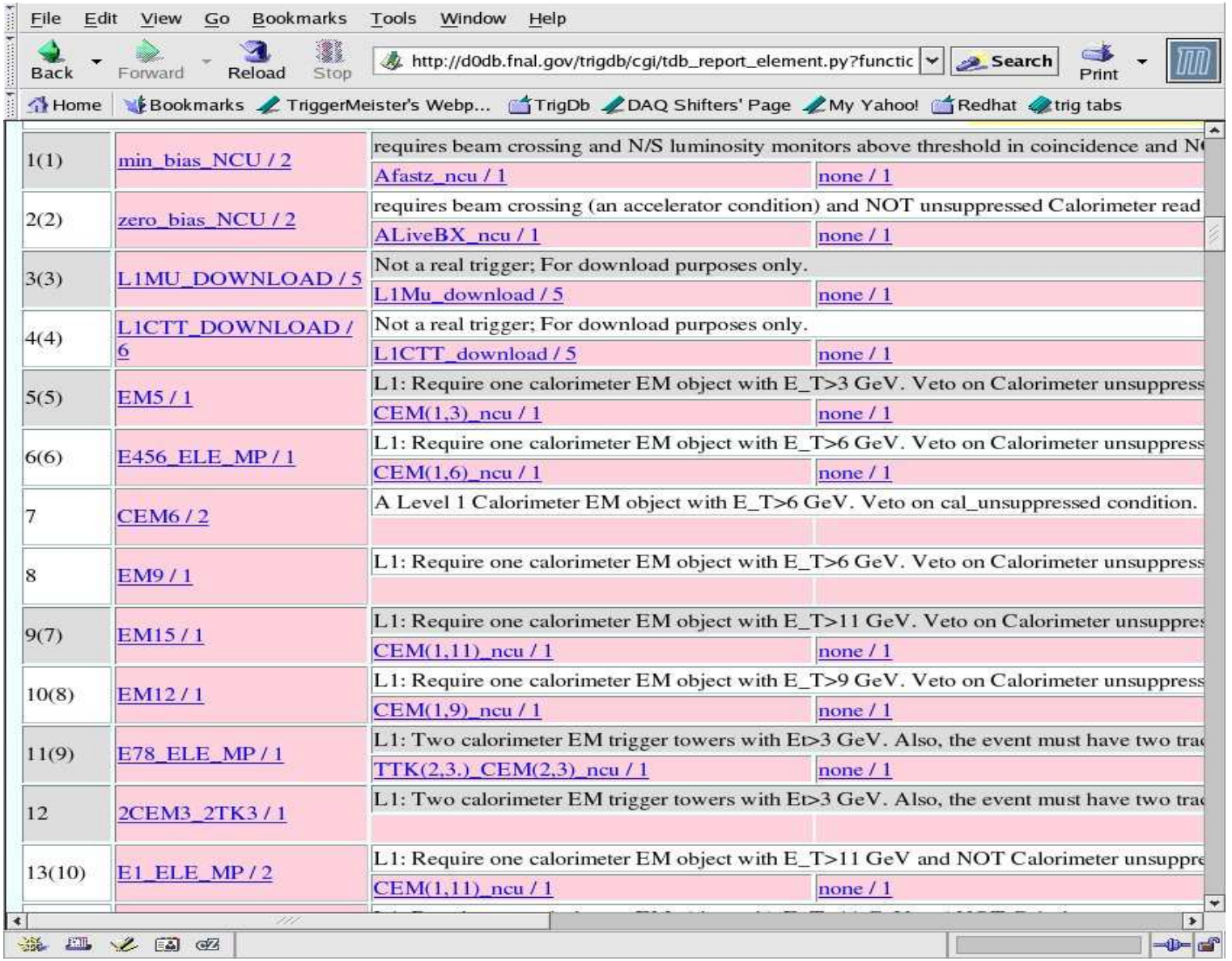
Group 1	allcrates / 1	regular	0															
L1 Cal Trigger Tower Programming (L1Dialog):	em11	em3	em6	em9	jt3	jt5	jt7	null										
L1 detector Neotypes : (Link to Neoterms)	CFT/CPS ctt/2.00	Calorimeter emcount/1.00	Calorimeter jetcount/1.00	Muon muo/2.00	Special (Named) And/Or specterm/1.00													
L2 filters :	none	ETA	EM	ETA	EM	ETA	EM	JET	HT	JET	RANDOMPASS	JET	MJT	MUON	JET	MJT	JET	MUON
L2 tools :	EM(0,3,3,5,1.5,0,0) / 1	EM(0,3,3,5,5.,0,0) / 1	JET(0,7.) / 1	JET(0,5.) / 1	COMMISSION / 1	MJT(0,10.) / 1	MUON(0,0,5,0) / 1											
L3 filters:	PassFraction	Ele	Ele	Ele	Ele	Ele	Ele	Ele	Ele	Ele	Ele	Ele	Ht	Jet	Jet			
	Ele	Ele	Ele	Ele	Ele	Ele	MEt	Ele	MEt	Track	Track	Ele	Ele	Ele	Ele			
	Ele	Ele	Ele	Jet	Jet	Jet	mp	Jet	mp	Jet	mp	Jet	Jet	Jet	mp			
	CFTVertex	Jet	Jet	MHt	Jet	Jet	Jet	mp	MEt	Track	mp	Muon	Muon	Track	Tr			
	Muon	Track	Ele	Ele	Jet	Muon	Tau	Jet	Jet	Track	Jet	mp	Track	mp	BI			
	Muon	Muon	Track	Muon	Track	mp	Muon	PassFraction										
L3 tools:	L3ERR_online/2	GEO/1	RUN_CFG/1	CAL_UNP_NLC_NAI														
	GlobalTracker/4	PrVTX3/1	CAL_CLUS4_PV3_NLC_ON/1	NONE/1														
	ELE_NLV_SHT/1	PhTrk7/1	ELE_NLV_SHT_T7/1	PhTrk13/1														
	ELE_NLV_T4/1	PhTrk8/1	ELE_NLV_T8/1	ELE_NLV_VL/1														
	PhTrk5/1	ELE_NLV_SH_T5/2	CAL_CLUS5_PV3_NLC_ON/1	SC5JET_9_PV3/1														
	ELE_Road_T3/1	ELE_Road_VL_T3/1	ELE_Road_VL_T5/1	VTXNULL/2														
	PrVTX_Z_TRK/3	CAL_CLUS5_PV1_NLC_ON/1	SC5JET_9_PV1/1	prvtx1_phys/1														
	MUO_LOCAL/3	Muon/2	MUO_CENTRAL_MATCH/1	MUON_CM/1														
	SC7JET8_PV3_NLC/1	TAU_LOOSE_TRACK/6	PrVTX05/1	XYVtx05_beam/1														

Report: global_CalMuon-12.37 (3)



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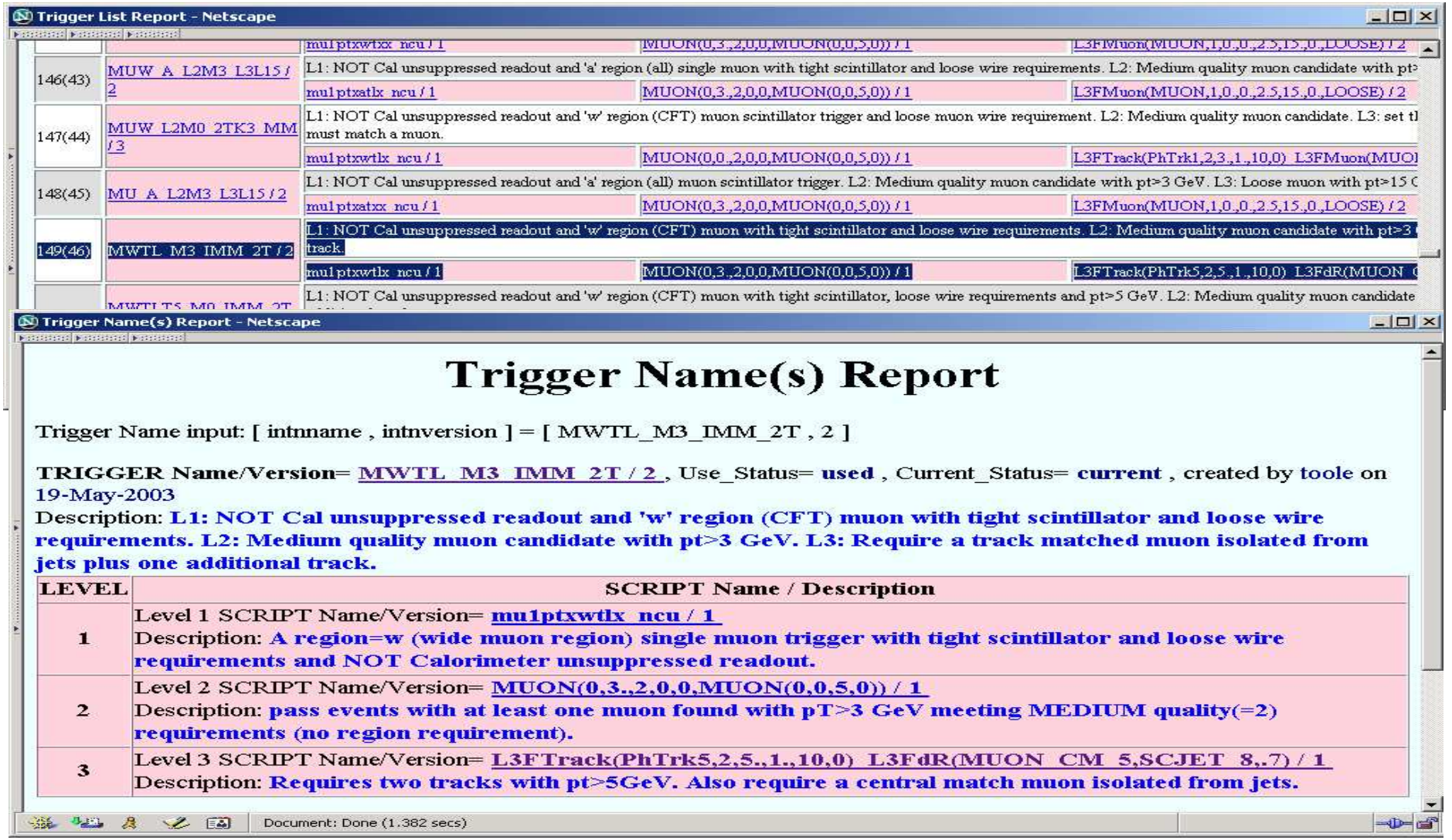
1(1)	min_bias_NCU / 2	requires beam crossing and N/S luminosity monitors above threshold in coincidence and N	
		Afastz_ncu / 1	none / 1
2(2)	zero_bias_NCU / 2	requires beam crossing (an accelerator condition) and NOT unsuppressed Calorimeter read	
		ALiveBX_ncu / 1	none / 1
3(3)	L1MU_DOWNLOAD / 5	Not a real trigger; For download purposes only.	
		L1Mu_download / 5	none / 1
4(4)	L1CTT_DOWNLOAD / 6	Not a real trigger; For download purposes only.	
		L1CTT_download / 5	none / 1
5(5)	EM5 / 1	L1: Require one calorimeter EM object with E_T>3 GeV. Veto on Calorimeter unsuppress	
		CEM(1,3)_ncu / 1	none / 1
6(6)	E456_ELE_MP / 1	L1: Require one calorimeter EM object with E_T>6 GeV. Veto on Calorimeter unsuppress	
		CEM(1,6)_ncu / 1	none / 1
7	CEM6 / 2	A Level 1 Calorimeter EM object with E_T>6 GeV. Veto on cal_unsuppressed condition.	
8	EM9 / 1	L1: Require one calorimeter EM object with E_T>6 GeV. Veto on Calorimeter unsuppress	
9(7)	EM15 / 1	L1: Require one calorimeter EM object with E_T>11 GeV. Veto on Calorimeter unsuppres	
		CEM(1,11)_ncu / 1	none / 1
10(8)	EM12 / 1	L1: Require one calorimeter EM object with E_T>9 GeV. Veto on Calorimeter unsuppress	
		CEM(1,9)_ncu / 1	none / 1
11(9)	E78_ELE_MP / 1	L1: Two calorimeter EM trigger towers with Et>3 GeV. Also, the event must have two trac	
		TTK(2,3.)_CEM(2,3)_ncu / 1	none / 1
12	2CEM3_2TK3 / 1	L1: Two calorimeter EM trigger towers with Et>3 GeV. Also, the event must have two trac	
13(10)	E1_ELE_MP / 2	L1: Require one calorimeter EM object with E_T>11 GeV and NOT Calorimeter unsuppre	
		CEM(1,11)_ncu / 1	none / 1

Two Triggers in every physics Trigger List

- zero_bias
  - Level 1 only trigger
    - Requiring NEOTERM ALiveBX
    - An accelerator based trigger
      - true on each of the 36 beam crossings of a single turn of the accelerator
      - About 1.7 M times per second
    - Used to cross check the luminosity measurement and trigger system functionality
    - Really is unbiased
- min_bias ('minimum biased')
  - Level 1 only trigger
    - requiring NEOTERM 'Afastz'
      - (and ALiveBX and ASkip0) – every trigger
    - Based on Luminosity monitor:
      - North, South scintillator array on beamline
    - Requires N and S pulse heights above threshold in timing coincidence
    - Gives a quick measure of the z vertex
  - Necessary to measure luminosity
  - Is undoubtedly biased physics-wise

Example:
Trigger MWTL_M3_IMM_2T / 2



Trigger List Report - Netscape

	mu1ptxwtxx_ncu / 1	MUON(0,3.,2,0,0,MUON(0,0,5,0)) / 1	L3FMuon(MUON,1,0.,0.,2.5,15.,0.,LOOSE) / 2
146(43)	MUW_A_L2M3_L3L15 / 2	L1: NOT Cal unsuppressed readout and 'a' region (all) single muon with tight scintillator and loose wire requirements. L2: Medium quality muon candidate with pt>		
	mu1ptxatlx_ncu / 1	MUON(0,3.,2,0,0,MUON(0,0,5,0)) / 1	L3FMuon(MUON,1,0.,0.,2.5,15.,0.,LOOSE) / 2
147(44)	MUW_L2M0_2TK3_MM / 3	L1: NOT Cal unsuppressed readout and 'w' region (CFT) muon scintillator trigger and loose muon wire requirement. L2: Medium quality muon candidate. L3: set tl must match a muon.		
	mu1ptxwtlx_ncu / 1	MUON(0,0.,2,0,0,MUON(0,0,5,0)) / 1	L3FTrack(PhTrk1,2,3.,1.,10,0) L3FMuon(MUO
148(45)	MU_A_L2M3_L3L15 / 2	L1: NOT Cal unsuppressed readout and 'a' region (all) muon scintillator trigger. L2: Medium quality muon candidate with pt>3 GeV. L3: Loose muon with pt>15 (		
	mu1ptxatxx_ncu / 1	MUON(0,3.,2,0,0,MUON(0,0,5,0)) / 1	L3FMuon(MUON,1,0.,0.,2.5,15.,0.,LOOSE) / 2
149(46)	MWTL_M3_IMM_2T / 2	L1: NOT Cal unsuppressed readout and 'w' region (CFT) muon with tight scintillator and loose wire requirements. L2: Medium quality muon candidate with pt>3 (track.		
	mu1ptxwtlx_ncu / 1	MUON(0,3.,2,0,0,MUON(0,0,5,0)) / 1	L3FTrack(PhTrk5,2,5.,1.,10,0) L3FdR(MUON_(
	MWTL_TS_M0_IMM_2T	L1: NOT Cal unsuppressed readout and 'w' region (CFT) muon with tight scintillator, loose wire requirements and pt>5 GeV. L2: Medium quality muon candidate		

Trigger Name(s) Report - Netscape

Trigger Name(s) Report

Trigger Name input: [intnname , intnversion] = [MWTL_M3_IMM_2T , 2]

TRIGGER Name/Version= MWTL_M3_IMM_2T / 2 , Use_Status= **used** , Current_Status= **current** , created by toole on 19-May-2003

Description: **L1: NOT Cal unsuppressed readout and 'w' region (CFT) muon with tight scintillator and loose wire requirements. L2: Medium quality muon candidate with pt>3 GeV. L3: Require a track matched muon isolated from jets plus one additional track.**

LEVEL	SCRIPT Name / Description
1	Level 1 SCRIPT Name/Version= mu1ptxwtlx_ncu / 1 Description: **A region=w (wide muon region) single muon trigger with tight scintillator and loose wire requirements and NOT Calorimeter unsuppressed readout.**
2	Level 2 SCRIPT Name/Version= MUON(0,3.,2,0,0,MUON(0,0,5,0)) / 1 Description: **pass events with at least one muon found with pT>3 GeV meeting MEDIUM quality(=2) requirements (no region requirement).**
3	Level 3 SCRIPT Name/Version= L3FTrack(PhTrk5,2,5.,1.,10,0) L3FdR(MUON_CM_5,SCJET_8,.7) / 1 Description: **Requires two tracks with pt>5GeV. Also require a central match muon isolated from jets.**

Document: Done (1.382 secs)

Example:
Trigger MWTL_M3_IMM_2T / 2

Trigger Script(s) Report - Netscape

Trigger Script(s) Report

Trigger Level: [slevel] = [l3]
Script input: [insname , insversion] = [L3FTRACK(PHTRK5,2,5.,1.,10,0)_L3FDR(MUON_CM_5,SCJET_8,.7) , 1]

SCRIPT NAME= L3FTrack(PhTrk5,2,5.,1.,10,0)_L3FdR(MUON_CM_5,SCJET_8,.7) / 1 , Version= **1** , Use_Status= **used** , Current_Status= **current** , created by toole on 19-May-2003
Description: **Requires two tracks with pt>5GeV. Also require a central match muon isolated from jets.**

ORDER	Includes Level 3 Filter TERM(s):
1	Term Name: L3FTrack(PhTrk5,2,5.,1.,10,0) / 1
2	Term Name: L3FdR(MUON_CM_5,SCJET_8,.7) / 2

Document: Done (1.061 secs)

Trigger Level 3 Term Report - Netscape

Trigger Level 3 Term Report

Term Name/Version= L3FdR(MUON_CM_5,SCJET_8,.7) / 2 , Use_Status= **used** , Current_Status= **current** , created by toole on 19-May-2003_10:04
Description: **require a muon with a central track match to be isolated by dR>.7 from all jet candidates with Et>8 GeV.**
is based on a Level 3 OBJECT name= L3FdR , CVS_package= **l3filters** , Version= **p15**

Order	Parameter	Type	Value	PVTVersion	Default
1	key1	filter	L3FMuon(MUON_CM,1,0.,0.,2.5,0.,5.,LOOSE)	1	-
2	key2	filter	L3FJet(SC7JET8_PV3_NLC,0,8.,0.,3.)	1	-
3	DR	float	.7	-	.7

Document: Done (1.192 secs)

L3: Whaaaaat's that ?

- Mark and Pass (special filter)
  - A Level 3 Filter designed to create samples for L3 trigger analysis (not for physics analysis)
  - Has one argument: pass_1_of_n
  - Action: puts 1 of every n events passing through it into the inclusive 'monitor' stream
  - Events written to the monitor stream are not intended for physics analysis
    - No luminosity accounting for monitor stream
    - Events recorded exclusively to the monitor stream events
      - do not get registered in the SAM event catalog
      - Cannot use 'pick events' utility to get them
  - Level 3 scripts using this filter have mp* in their name, where pass_1_of_n = *
- Other shortnames:
  - 'ps*' -- for L3FPrescale, prescale = *
  - 'pf*' -- for L3FPassFraction, fraction = *

Trigger List Rules ...

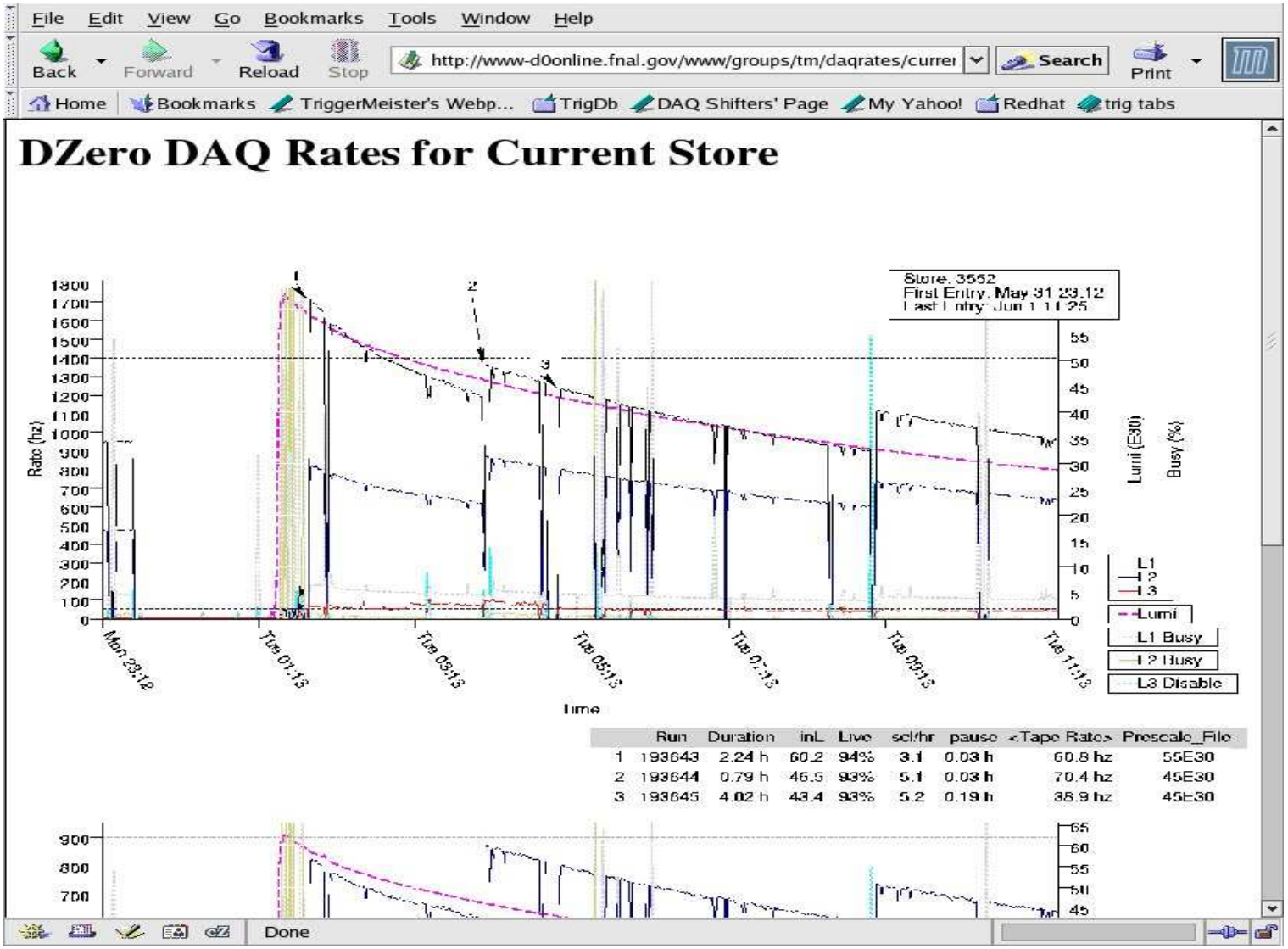
Examples of rules for valid Triggers, Lists…

- all Trigger Names must
  - be unique (in that Trigger List)
  - len(TriggerName) ≤ 16 (thumbnail)
  - cannot contain special characters
- cannot use more than 4 Level1 Calorimeter EM or JET thresholds
- cannot use more than 32 L1 muon terms from the set of 256 valid terms
- cannot use more than 128 unique L1L2 bits
- L3 filters and tools mustn't use different versions of tools of the same name
- L3 filters and tools may call other tools, but tools may not call filters (not true at L2)
- L3 tool names must conform to SR parsing rules
- …

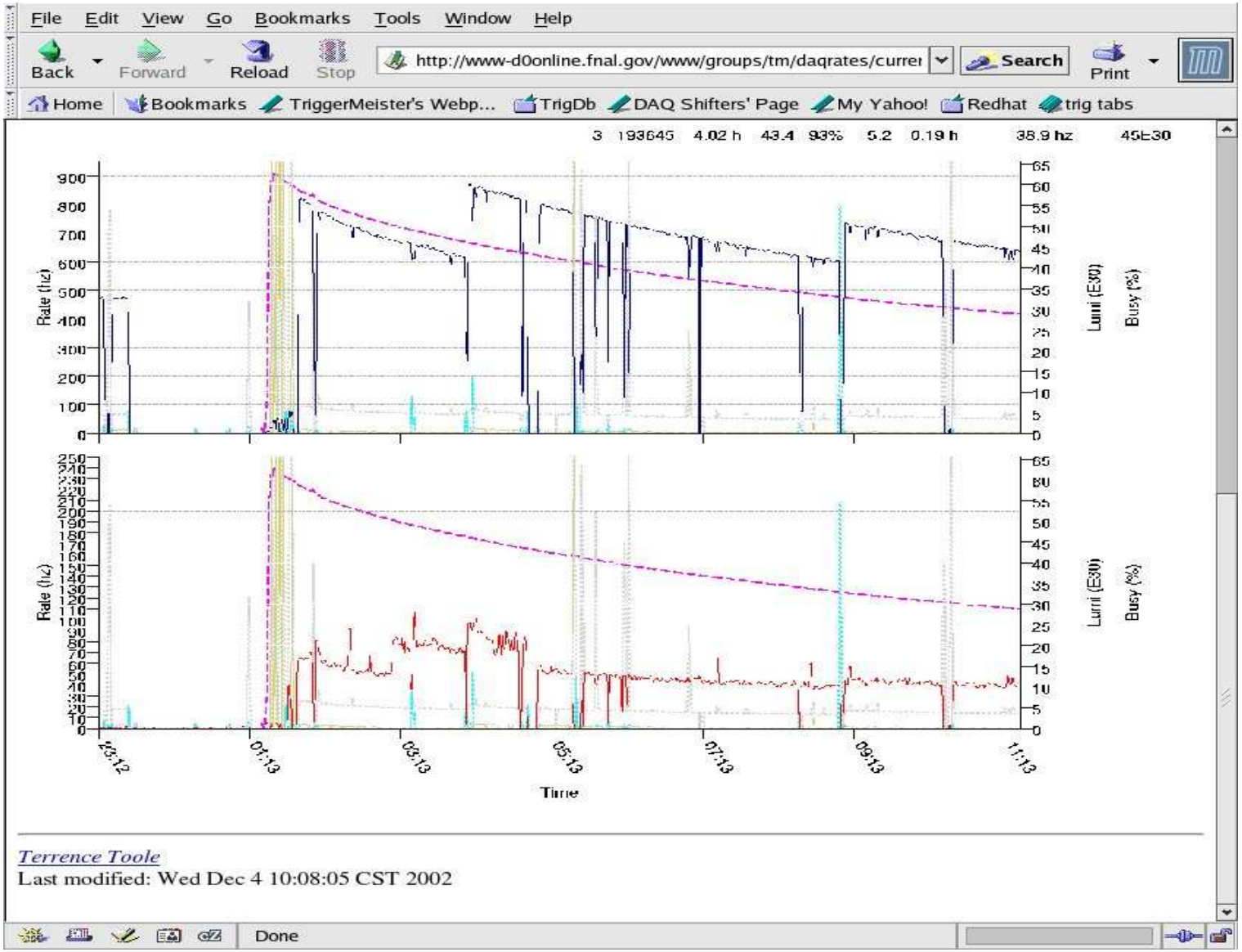
Many rules checked upon db entry, but the 'xml' generator checks many features as well ...

Monitoring Tools

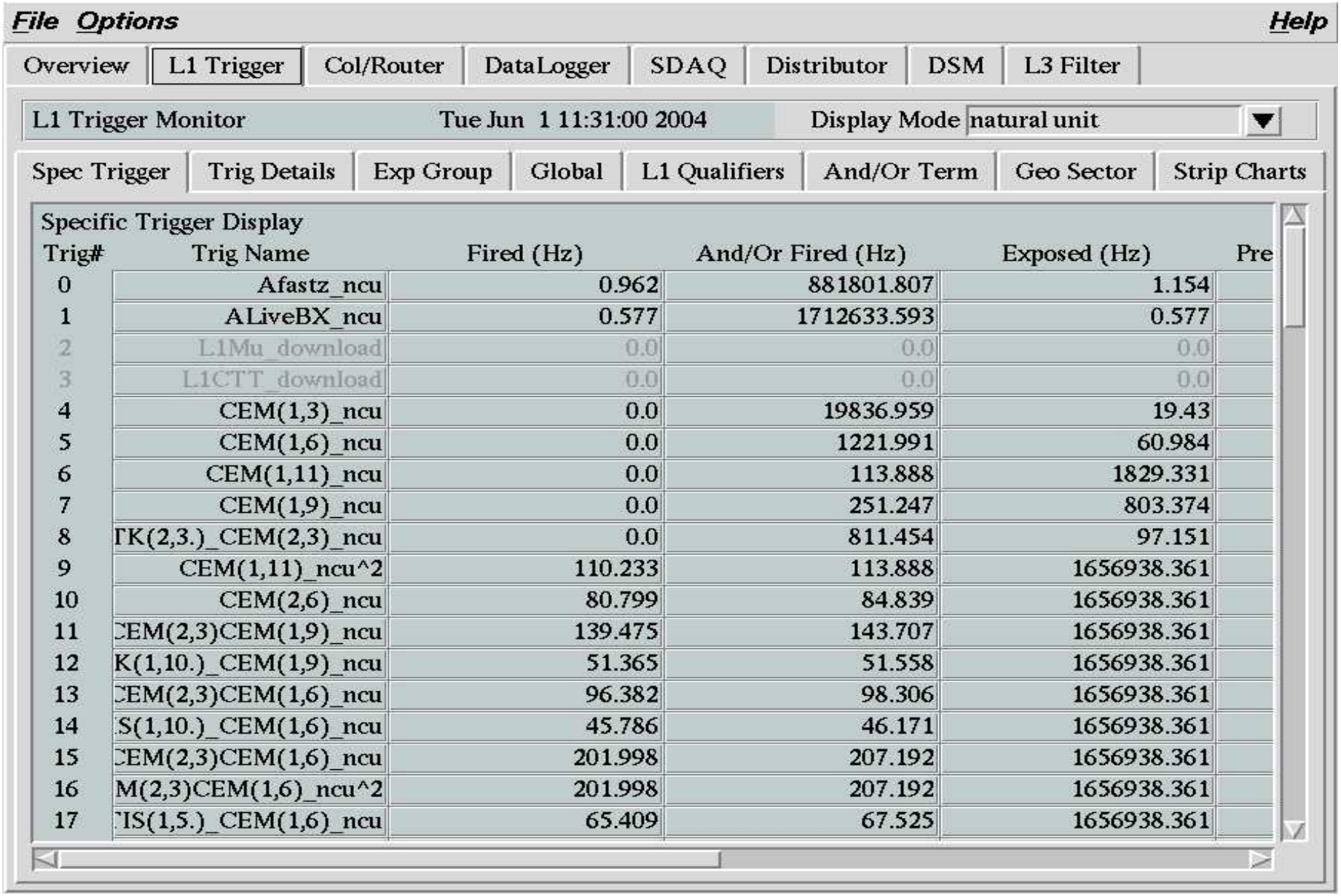
DAQ Rates (1)


File Edit View Go Bookmarks Tools Window Help
Back Forward Reload Stop
http://www-d0online.fnal.gov/www/groups/tm/daqrates/curre
Search Print
Home Bookmarks TriggerMeister's Webp... TrigDb DAQ Shifters' Page My Yahoo! Redhat trig tabs
DZero DAQ Rates for Current Store
Store: 3552
First Entry: May 31 23:12
Last Entry: Jun 1 11:25
Rate (hz)
Lumi (E30)
Busy (%)
Time
Mon 23:12
Tue 01:13
Tue 03:13
Tue 05:13
Tue 07:13
Tue 09:13
Tue 11:13
L1
L2
L3
Lumi
L1 Busy
L2 Busy
L3 Disable
Run Duration inL Live sc/hr pause <Tape Rate> Prescale_File
1 193643 2.24 h 60.2 94% 3.1 0.03 h 60.8 hz 55E30
2 193644 0.79 h 46.5 93% 5.1 0.03 h 70.4 hz 45E30
3 193645 4.02 h 43.4 93% 5.2 0.19 h 38.9 hz 45E30
Done

DAQ Rates (2)


File Edit View Go Bookmarks Tools Window Help
Back Forward Reload Stop
http://www-d0online.fnal.gov/www/groups/tm/daqrates/curre
Search Print
Home Bookmarks TriggerMeister's Webp... TrigDb DAQ Shifters' Page My Yahoo! Redhat trig tabs
3 193645 4.02 h 43.4 93% 5.2 0.19 h 38.9 hz 45E30
Rate (hz)
Lumi (E30)
Busy (%)
Time
Terrence Toole
Last modified: Wed Dec 4 10:08:05 CST 2002
Done

DAQ monitor - Spec trigger



File Options Help

Overview | L1 Trigger | Col/Router | DataLogger | SDAQ | Distributor | DSM | L3 Filter

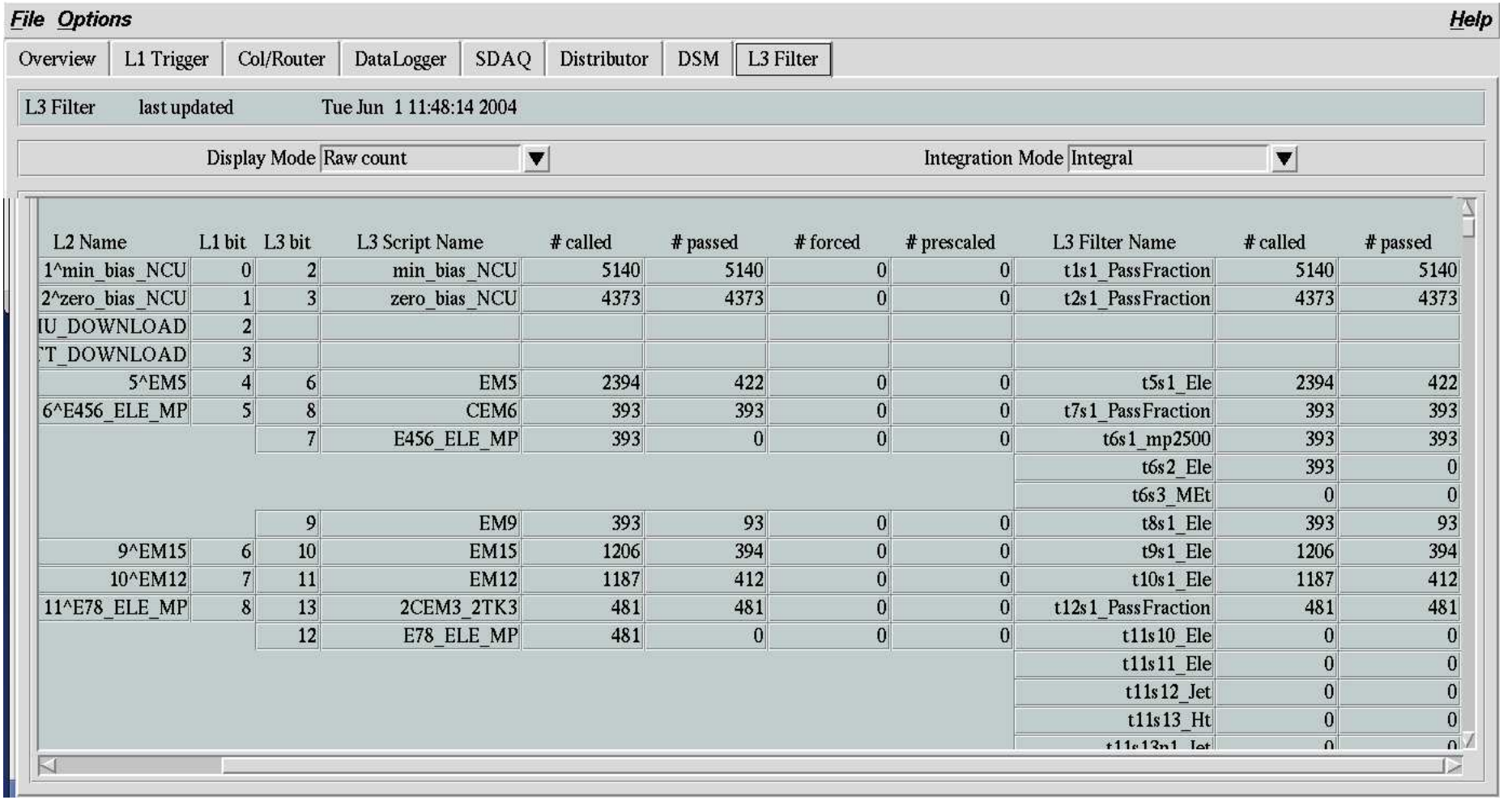
L1 Trigger Monitor Tue Jun 1 11:31:00 2004 Display Mode: natural unit

Spec Trigger | Trig Details | Exp Group | Global | L1 Qualifiers | And/Or Term | Geo Sector | Strip Charts

Specific Trigger Display

Trig#	Trig Name	Fired (Hz)	And/Or Fired (Hz)	Exposed (Hz)	Pre
0	Afastz_ncu	0.962	881801.807	1.154	
1	ALiveBX_ncu	0.577	1712633.593	0.577	
2	L1Mu_download	0.0	0.0	0.0	
3	L1CTT_download	0.0	0.0	0.0	
4	CEM(1,3)_ncu	0.0	19836.959	19.43	
5	CEM(1,6)_ncu	0.0	1221.991	60.984	
6	CEM(1,11)_ncu	0.0	113.888	1829.331	
7	CEM(1,9)_ncu	0.0	251.247	803.374	
8	ΓK(2,3.)_CEM(2,3)_ncu	0.0	811.454	97.151	
9	CEM(1,11)_ncu^2	110.233	113.888	1656938.361	
10	CEM(2,6)_ncu	80.799	84.839	1656938.361	
11	ΞEM(2,3)CEM(1,9)_ncu	139.475	143.707	1656938.361	
12	K(1,10.)_CEM(1,9)_ncu	51.365	51.558	1656938.361	
13	ΞEM(2,3)CEM(1,6)_ncu	96.382	98.306	1656938.361	
14	S(1,10.)_CEM(1,6)_ncu	45.786	46.171	1656938.361	
15	ΞEM(2,3)CEM(1,6)_ncu	201.998	207.192	1656938.361	
16	M(2,3)CEM(1,6)_ncu^2	201.998	207.192	1656938.361	
17	ΊS(1,5.)_CEM(1,6)_ncu	65.409	67.525	1656938.361	

DAQ Monitor – L3 Filter



File Options Help

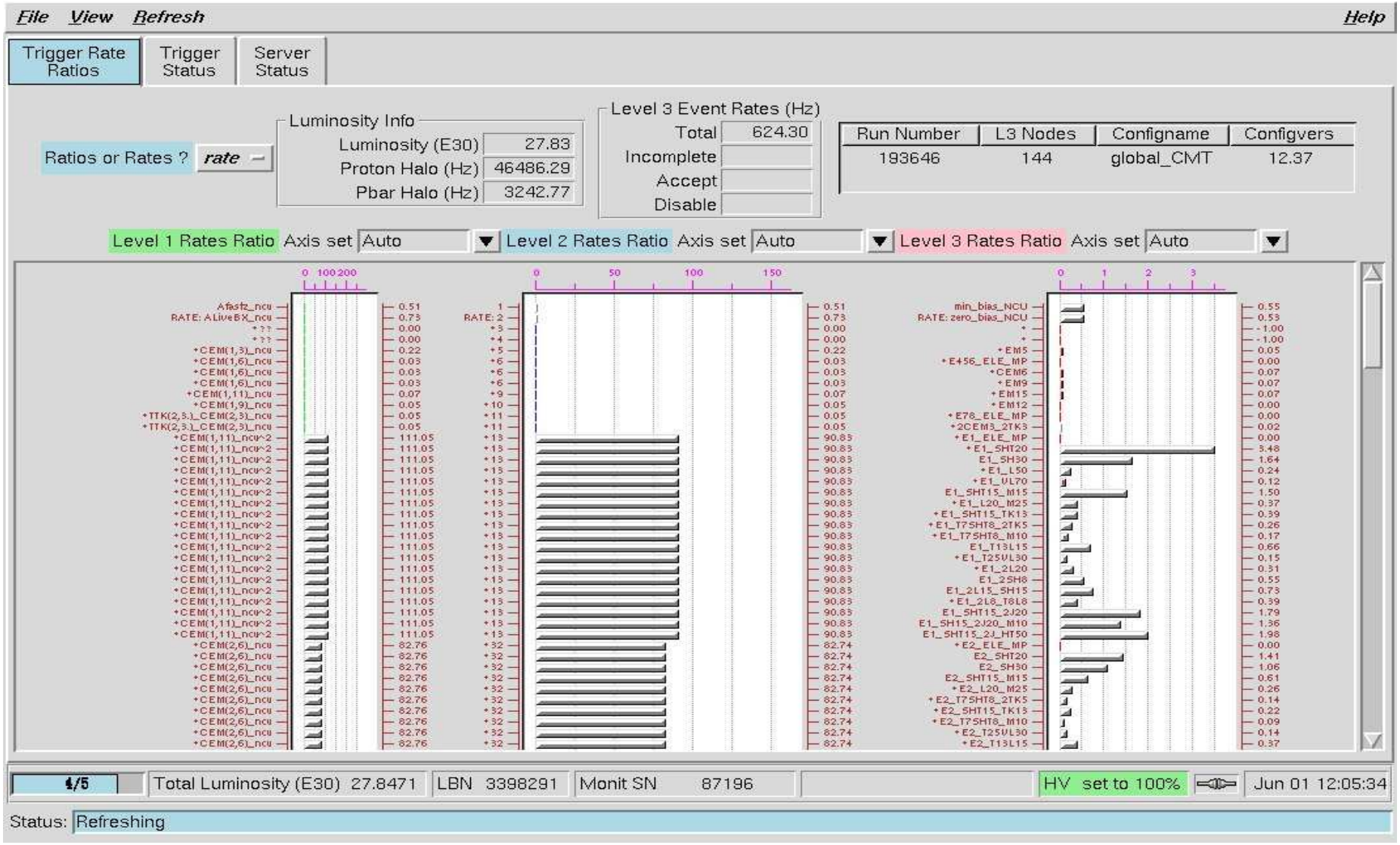
Overview | L1 Trigger | Col/Router | DataLogger | SDAQ | Distributor | DSM | L3 Filter

L3 Filter last updated Tue Jun 1 11:48:14 2004

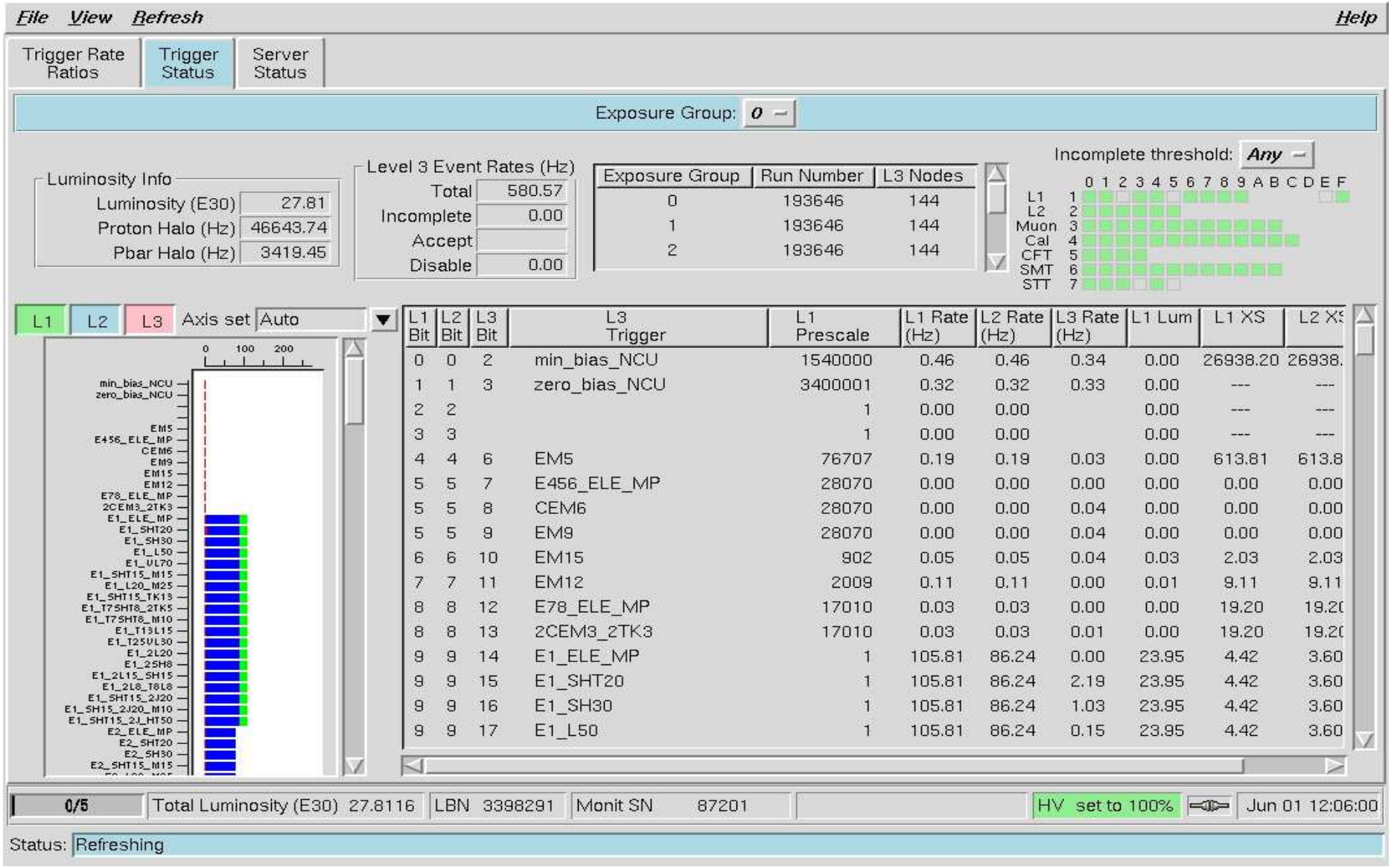
Display Mode: Raw count Integration Mode: Integral

L2 Name	L1 bit	L3 bit	L3 Script Name	# called	# passed	# forced	# prescaled	L3 Filter Name	# called	# passed
1^min_bias_NCU	0	2	min_bias_NCU	5140	5140	0	0	t1s1_PassFraction	5140	5140
2^zero_bias_NCU	1	3	zero_bias_NCU	4373	4373	0	0	t2s1_PassFraction	4373	4373
IU_DOWNLOAD	2									
T_DOWNLOAD	3									
5^EM5	4	6	EM5	2394	422	0	0	t5s1_Ele	2394	422
6^E456_ELE_MP	5	8	CEM6	393	393	0	0	t7s1_PassFraction	393	393
		7	E456_ELE_MP	393	0	0	0	t6s1_mp2500	393	393
								t6s2_Ele	393	0
								t6s3_MEt	0	0
		9	EM9	393	93	0	0	t8s1_Ele	393	93
9^EM15	6	10	EM15	1206	394	0	0	t9s1_Ele	1206	394
10^EM12	7	11	EM12	1187	412	0	0	t10s1_Ele	1187	412
11^E78_ELE_MP	8	13	2CEM3_2TK3	481	481	0	0	t12s1_PassFraction	481	481
		12	E78_ELE_MP	481	0	0	0	t11s10_Ele	0	0
								t11s11_Ele	0	0
								t11s12_Jet	0	0
								t11s13_Ht	0	0
								t11s13p1_Jet	0	0

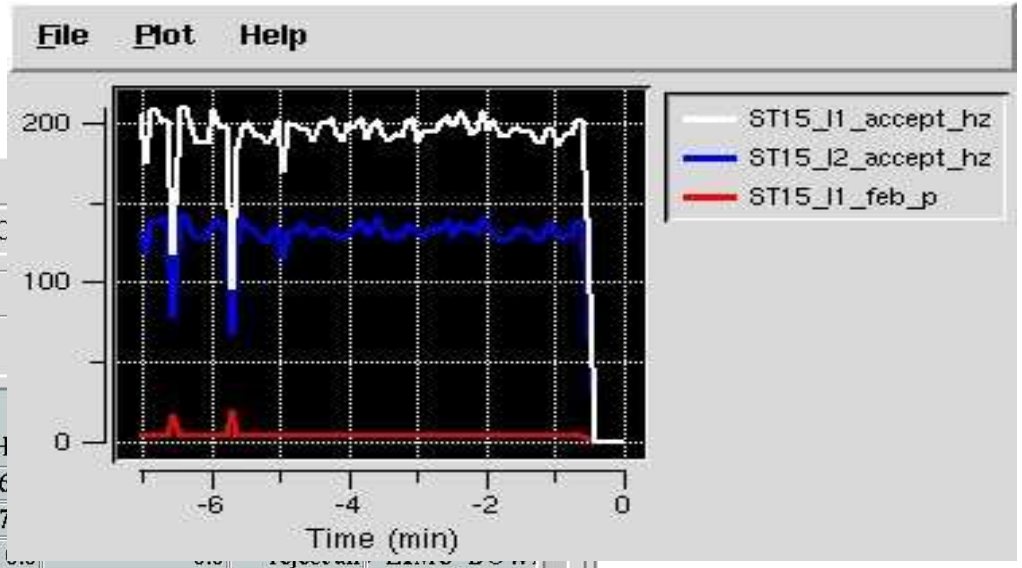
LmTrigger (1)


File View Refresh
Help
Trigger Rate Ratios
Trigger Status
Server Status
Luminosity Info
Luminosity (E30) 27.83
Proton Halo (Hz) 46486.29
Pbar Halo (Hz) 3242.77
Ratios or Rates ? rate
Level 3 Event Rates (Hz)
Total 624.30
Incomplete
Accept
Disable
Run Number 193646
L3 Nodes 144
Configname global_CMT
Configvers 12.37
Level 1 Rates Ratio Axis set Auto
Level 2 Rates Ratio Axis set Auto
Level 3 Rates Ratio Axis set Auto
4/5
Total Luminosity (E30) 27.8471
LBN 3398291
Monit SN 87196
HV set to 100%
Jun 01 12:05:34
Status: Refreshing

LmTrigger (2)


File View Refresh
Help
Trigger Rate Ratios
Trigger Status
Server Status
Exposure Group: 0
Luminosity Info
Luminosity (E30) 27.81
Proton Halo (Hz) 46643.74
Pbar Halo (Hz) 3419.45
Level 3 Event Rates (Hz)
Total 580.57
Incomplete 0.00
Accept
Disable 0.00
Exposure Group | Run Number | L3 Nodes
0 193646 144
1 193646 144
2 193646 144
Incomplete threshold: Any
0 1 2 3 4 5 6 7 8 9 A B C D E F
L1 1
L2 2
Muon 3
Cal 4
CFT 5
SMT 6
STT 7
L1 L2 L3 Axis set Auto
0 100 200
min_bias_NCU
zero_bias_NCU
EM5
E456_ELE_MP
CEM6
EM9
EM15
EM12
E78_ELE_MP
2CEM3_2TK3
E1_ELE_MP
E1_SHT20
E1_SH30
E1_L50
E1_UL70
E1_SHT15_M15
E1_L20_M25
E1_SHT15_TK13
E1_T75HT8_2TK5
E1_T75HT8_M10
E1_T13L15
E1_T25UL30
E1_2L20
E1_2SH8
E1_2L15_SH15
E1_2L8_T8L8
E1_SHT15_2J20
E1_SH15_2J20_M10
E1_SHT15_2J_HT50
E2_ELE_MP
E2_SHT20
E2_SH30
E2_SHT15_M15
L1 Bit | L2 Bit | L3 Bit | L3 Trigger | L1 Prescale | L1 Rate (Hz) | L2 Rate (Hz) | L3 Rate (Hz) | L1 Lum | L1 XS | L2 XS
0 0 2 min_bias_NCU 1540000 0.46 0.46 0.34 0.00 26938.20 26938.
1 1 3 zero_bias_NCU 3400001 0.32 0.32 0.33 0.00 --- ---
2 2 1 0.00 0.00 0.00 --- ---
3 3 1 0.00 0.00 0.00 --- ---
4 4 6 EM5 76707 0.19 0.19 0.03 0.00 613.81 613.8
5 5 7 E456_ELE_MP 28070 0.00 0.00 0.00 0.00 0.00 0.00
5 5 8 CEM6 28070 0.00 0.00 0.04 0.00 0.00 0.00
5 5 9 EM9 28070 0.00 0.00 0.04 0.00 0.00 0.00
6 6 10 EM15 902 0.05 0.05 0.04 0.03 2.03 2.03
7 7 11 EM12 2009 0.11 0.11 0.00 0.01 9.11 9.11
8 8 12 E78_ELE_MP 17010 0.03 0.03 0.00 0.00 19.20 19.20
8 8 13 2CEM3_2TK3 17010 0.03 0.03 0.01 0.00 19.20 19.20
9 9 14 E1_ELE_MP 1 105.81 86.24 0.00 23.95 4.42 3.60
9 9 15 E1_SHT20 1 105.81 86.24 2.19 23.95 4.42 3.60
9 9 16 E1_SH30 1 105.81 86.24 1.03 23.95 4.42 3.60
9 9 17 E1_L50 1 105.81 86.24 0.15 23.95 4.42 3.60
0/5
Total Luminosity (E30) 27.8116
LBN 3398291
Monit SN 87201
HV set to 100%
Jun 01 12:06:00
Status: Refreshing

L2 Monitor Guis



File Options

TRGFR | L2 Dataflow | L2 Trigger | L2 HS | L2 Filter | DSM | L2 SLIC

L1 Trigger Monitor Tue Jun 1 12:11:29 2004

Global | Spec Trigger | Geo Sector

Specific Trigger Display

Trig#	Trig Name	L1 accept (Hz)	av L1 acc. (Hz)	L2 accept (H			
0	Afastz_ncu	0.625	0.408	0.6			
1	ALiveBX_ncu	0.703	0.348	0.7			
2	L1Mu_download	0.0	0.0				
3	L1CTT_download	0.0	0.0	0.0	0.0	reject all	`L1CTT_DOWI
4	CEM(1,3)_ncu	0.117	0.173	0.117	0.17	1.0	
5	CEM(1,6)_ncu	0.0	0.011	0.0	0.013	1.0	6^E456_I
6	CEM(1,11)_ncu	0.039	0.05	0.039	0.064	1.0	
7	CEM(1,9)_ncu	0.117	0.077	0.117	0.08	1.0	1
8	TK(2,3.)_CEM(2,3)_ncu	0.078	0.049	0.078	0.051	1.0	11^E78_I
9	CEM(1,11)_ncu^2	111.424	76.294	91.023	67.152	1.14	13^E1_I
10	CEM(2,6)_ncu	78.868	56.274	79.025	57.162	1.0	32^E2_I
11	CEM(2,3)CEM(1,9)_ncu	137.14	93.401	137.023	94.894	1.0	51^E3_I
12	K(1,10.)_CEM(1,9)_ncu	56.044	38.14	55.966	38.825	1.0	68^E4_I
13	CEM(2,3)CEM(1,6)_ncu	95.127	65.566	95.166	66.812	1.0	83^E5_I
14	S(1,10.)_CEM(1,6)_ncu	42.404	27.553	42.287	27.587	1.0	94^E6_I
15	CEM(2,3)CEM(1,6)_ncu	197.562	127.816	134.17	86.621	1.48	105^E7A

Prescale file

File Edit View Go Bookmarks Tools Window Help

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L1BitName	Prescale	Priority	TriggerName	L2Rej	L3Rej	Expected Rates at_25E30 L1	L2	L3	L3MP	TapeRt (tot 1.30)	Unprescaled Rates L1_at 1E30	L1_at 25E30	L3_at 25E30	pp
Afastz_ncu	1375000	##f	min_bias_NCU	1.00	1.00	0.61	0.61	0.61	0	0.00	3.36e+04	8.40e+05	8.40e+05	0
ALiveBX_ncu	3400001	##f	zero_bias_NCU	1.00	1.00	12.50	12.50	12.50	0	0.00	1.70e+06	1.70e+06	4.25e+07	0
L1Mu_download	0	##p	L1MU_DOWNLOAD	1.00	1.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0
L1CTT_download	0	##p	L1CTT_DOWNLOAD	1.00	1.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0
CEM(1,3)_ncu	10958	##v80-130	EM5	1.00	5.74	1.44	1.44	0.25	0	0.00	629.00	1.57e+04	2739.55	0
CEM(1,6)_ncu	4010	##v80-130	E456_ELE_MP	1.00	1.00	0.25	0.25	0.25	2500	0.00	40.10	1002.50	1002.50	0
		##v80-130	CEM6	1.00	1.00	0.25	0.25	0.25	0	0.00	40.10	1002.50	1002.50	0
		##v80-130	EM9	1.00	3.75	0.25	0.25	0.07	0	0.00	40.10	1002.50	267.33	0
CEM(1,11)_ncu	129	##v80-130	EM15	1.00	3.09	0.77	0.77	0.25	0	0.00	3.98	99.50	32.20	0
CEM(1,9)_ncu	287	##v80-130	EM12	1.00	3.01	0.75	0.75	0.25	0	0.00	8.64	216.00	71.76	0
TTK(2,3.)_CEM(2,3)_ncu	6075	##v80-q30	E78_ELE_MP	1.00	1.00	0.10	0.10	0.10	2500	0.00	24.30	607.50	607.50	1
		##v80-q30	2CEM3_2TK3	1.00	1.00	0.10	0.10	0.10	0	0.00	24.30	607.50	607.50	1
CEM(1,11)_ncu^2	1	##u	E1_ELE_MP	1.00	2484.85	96.25	96.25	0.04	2500	0.04	3.85	96.25	0.04	0
		##u	E1_SHT20	1.00	33.90	96.25	96.25	2.84	0	0.00	3.85	96.25	2.84	0
		##u	E1_SH30	1.00	72.90	96.25	96.25	1.32	0	0.00	3.85	96.25	1.32	0
		##u	E1_L50	1.00	364.00	96.25	96.25	0.26	0	0.00	3.85	96.25	0.26	0
		##u	E1_VL70	1.00	938.00	96.25	96.25	0.10	0	0.00	3.85	96.25	0.10	0
		##u	E1_SHT15_M15	1.00	92.10	96.25	96.25	1.05	0	0.00	3.85	96.25	1.05	0
		##u	E1_L20_M25	1.00	172.00	96.25	96.25	0.56	0	0.00	3.85	96.25	0.56	0
		##u	E1_SHT15_TK13	1.00	261.00	96.25	96.25	0.37	0	0.00	3.85	96.25	0.37	0
		##u	E1_T7SHT8_2TK5	1.00	523.00	96.25	96.25	0.18	0	0.00	3.85	96.25	0.18	0
		##u	E1_T7SHT8_M10	1.00	613.00	96.25	96.25	0.16	0	0.00	3.85	96.25	0.16	0
		##u	E1_T13L15	1.00	127.00	96.25	96.25	0.76	0	0.00	3.85	96.25	0.76	0
		##u	E1_T25VL30	1.00	772.00	96.25	96.25	0.12	0	0.00	3.85	96.25	0.12	0
		##u	E1_2L20	1.00	492.00	96.25	96.25	0.20	0	0.00	3.85	96.25	0.20	0
		##u	E1_2SH8	1.00	259.00	96.25	96.25	0.37	0	0.00	3.85	96.25	0.37	0
		##u	E1_2L15_SH15	1.00	265.00	96.25	96.25	0.36	0	0.00	3.85	96.25	0.36	0
		##u	E1_2L8_T8L8	1.00	298.00	96.25	96.25	0.32	0	0.00	3.85	96.25	0.32	0
		##u	E1_SHT15_2J20	1.00	69.10	96.25	96.25	1.39	0	0.00	3.85	96.25	1.39	0
		##u	E1_SH15_2J20_M10	1.00	91.70	96.25	96.25	1.05	0	0.00	3.85	96.25	1.05	0
		##u	E1_SHT15_2J_HT50	1.00	66.30	96.25	96.25	1.45	0	0.00	3.85	96.25	1.45	0
CEM(2,6)_ncu	1	##p80-u50	E2_ELE_MP	1.00	2478.42	67.25	67.25	0.03	2500	0.03	2.69	67.25	0.03	0
		##p80-u50	E2_SHT20	1.00	63.90	67.25	67.25	1.05	0	0.00	2.69	67.25	1.05	0
		##p80-u50	E2_SH30	1.00	79.80	67.25	67.25	0.84	0	0.00	2.69	67.25	0.84	0
		##p80-u50	E2_SHT15_M15	1.00	241.00	67.25	67.25	0.28	0	0.00	2.69	67.25	0.28	0
		##p80-u50	E2_L20_M25	1.00	221.00	67.25	67.25	0.30	0	0.00	2.69	67.25	0.30	0
		##p80-u50	E2_T7SHT8_2TK5	1.00	669.00	67.25	67.25	0.10	0	0.00	2.69	67.25	0.10	0
		##p80-u50	E2_SHT15_TK13	1.00	392.00	67.25	67.25	0.17	0	0.00	2.69	67.25	0.17	0
		##p80-u50	E2_T7SHT8_M10	1.00	1110.00	67.25	67.25	0.06	0	0.00	2.69	67.25	0.06	0
		##p80-u50	E2_T25VL30	1.00	727.00	67.25	67.25	0.09	0	0.00	2.69	67.25	0.09	0
		##p80-u50	E2_T13L15	1.00	152.00	67.25	67.25	0.44	0	0.00	2.69	67.25	0.44	0

Done

That's it!